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WORLD PETROLEUM

Hearings on U. S. Oil Industry Code • J. B. Aug. Kessler on Rationalization of World Oil Industry • British Support Coal Hydrogenation • French Monopoly Postponed • Lok Batan Changes Aspects of Soviet Oil Industry • Financial Outlook for 1933

AUGUST • 1933

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PETROLEUM

Dangers of Price Fixing

DISAGREEMENTS in regard to the provisions that should be included in the U. S. oil industry code applying to production and refining have led Hugh Johnson, industrial recovery administrator, to take over the work of devising a code for this branch of the industry. Work on a revised marketing code has been turned over to a committee representing all interests of the oil industry as described elsewhere in this issue. Next to the hours and wages of labor, considered by the administration to be the most vital single factor in assuring the success of NIRA (National Industrial Recovery Act), provisions relating to the lease and agency practice and governmental price fixing of petroleum products are by far the most important and controversial subjects before the committee which is working on the marketing code.

The lease and agency practice will apparently be eliminated by provisions of the revised marketing code judging from the trend of opinion displayed at the three-day hearings, held in Washington just prior to Mr. Johnson's announcement on the twenty-seventh of his selection of a committee to draw up a revised marketing code.

The question of governmental price fixing for petroleum products is not so definitely settled, however, and is of the utmost importance to the entire petroleum industry. Such a provision would seem to be hardly a necessary part of an effective code and carries with it possibilities for reducing the efficiency of the industry and hampering it in many ways.

In a paper delivered in testimony at the hearings J. N. Pew, Jr., vice president, Sun Oil Company, indicated clearly the dangers of such a step. Mr. Pew said:

"I wish emphatically to protest against price fixing on manufactured petroleum products. Wartime price fixing led the nations into an epoch of inflation whose consequences, after 15 years, are felt in universal depression and world-wide distress. Whether undertaken by government or by business; whether in coffee or rubber, tin or wheat, or what you will, it has meant ultimate calamity to the industry and disaster to the people who relied on it."

Mr. Pew considers that governmentally fixed prices would be sufficiently high to subsidize inefficiency, while more efficient organizations in the industry would receive profits out of all proportion to the services rendered as well as having their incentive to greater efficiency destroyed by an assured profit. He cites the railroads as an example of government control leading an industry into a hopeless state from which it has been found necessary for the public treasury to attempt to rescue it; public utilities are given as an example of government control that has failed to protect either consumers or stockholders.

In saying that a few simple enforceable rules are all the code that the petroleum industry needs and in protesting against price fixing, Mr. Pew takes a position that must be recognized as extremely sound and of ultimate benefit to the consuming public, the government, and the petroleum industry.

▼

Developing New Markets

SPEAKING before the World Petroleum Congress in London last month J. B. Aug Kessler, Joint Managing Director of the Royal Dutch-Shell Group, made a passing suggestion that is well worth the careful consideration of oil company executives and of those who are charged with the promotion of sales. Mr. Kessler takes the position that abnormally low prices for oil products, such as have prevailed for a long time past, are due less to overproduction of crude oil than to a maladjustment of the relationship between the output of gas and fuel oils and what he describes as the "legitimate" demand for these products.

Mr. Kessler refers particularly to the folly of the concentration of advertising effort by the various marketing organizations on the attempt to win for their particular brands a larger share of the limited demand, while neglecting constructive efforts to increase the proper and well-balanced demand for all products.

It is not to be expected that oil companies will neglect to impress upon the consuming public the value of the established brands from which their principal revenues are derived, but unquestionably there has been a tremendous waste in advertising, particularly where it has led to extravagant claims that tend to impair public confidence in all motor fuel advertising. If, without neglecting the proper and energetic promotion of their own particular brands, oil companies would devote a fair proportion of their expenditure to enlarging the field for the use of petroleum products, it would put the industry as a whole in a much sounder and stronger position with consequent advantage to all concerned.

Promotional endeavor could be applied with particularly

good effect to the expansion of demand for oil fuel in those applications which are clearly of growing commercial importance such as the use of high-speed Diesel engines. This phase of the subject is elaborated by Mr. Kessler in an article published on other pages of this issue which deserves the careful attention of all those interested in placing the petroleum industry on a more stable basis than it now occupies.

▼

Significance of Lok Batan

ALTHOUGH several very promising oil fields were discovered in the U.S.S.R. in the last few years, including gushers of high potentials in the Berekei district of Grozny, located in difficult mountainous country, in Sterlitamak, in the foothills of Southern Urals, and in Neftedag, in Western Turkestan, the crude oil production of Russia continued to decline since 1931, when the old fields of Baku and Grozny appeared to have reached their maximum output. The great, if not unsurmountable, difficulties of developing new reserves were due either to extreme distances from existing transportation facilities, as in the case of Turkestan and Sterlitamak, or to the severity of the terrain as in the case of Berekei. The lack of transportation facilities to new districts was first felt in the long delays of supplying such discoveries with various heavy equipment, thus postponing not only commercial development, but even the further reconnoitering of already proven structures of major importance. In fact, the indicated difficulties prevented the three new major areas from supplying to date any sizable volume of crude oil to existing refineries.

Therefore the discovery and the successful development of the Lok Batan field located only 10 miles from the refinery center of the Baku District, Black City, only six miles from the Bibi-Eibat field, and actually within two miles of crude oil and kerosene trunk pipelines from Baku to Batum, can be termed as an event of paramount importance to the Russian oil industry.

It is too early yet to pass final judgment on the size and potentiality of Lok Batan, but its proximity to Bibi-Eibat and the performance of the several wells recently completed, including the famous No. 45 which was brought in for around 140,000 bbl. per day, would indicate the presence of a field that may rival Bibi-Eibat.

The development of Lok Batan, as well as the final proving for large production of the Kala structure in the eastern Apsheron, definitely assures the Soviet Government a vast reserve of strategically located crude oil sufficient for any reasonable increase in production in the next few years, in which time improved methods of wildcat drilling and development of transportation facilities will make available to the country oil reserves far in excess of domestic and export requirements.

▼

World Petroleum Congress

THE WORLD PETROLEUM CONGRESS, held in London from the nineteenth to the twenty-fifth of July has proved an unqualified success. It was by far the largest and most important gathering of technologists in the history of the petroleum industry. Some 1,250 members enrolled at the Congress and nearly 250 technical papers were delivered. Congratulations are due to the Institution of Petroleum Technologists for the extremely able manner in which the Congress was organized and conducted.

The success of this Congress is ample demonstration of the value of regular gatherings of petroleum technologists and should insure a continuation of such assemblages at proper intervals. As the world's most important producing and consuming country, the United States would be an appropriate place to hold the next meeting, which it is hoped will become a regular fixture of the petroleum industry thus stimulating the exchange of technical theories and furnishing a convenient forum for discussion of the latest developments in the petroleum industry. The industry looks forward with interest to future meetings of the Congress.

Dinner to official delegates attending the World Petroleum Congress, London, July 19.

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Federal Officials to Write U. S. Oil Code

Industry Unable to Reach Agreement on Important Provisions—Hugh Johnson Decides Federal Administration Will Write Code to Submit to Committee Representing Industry.

TERMINATING a stormy three-day hearing in Washington, at which the code designed to regulate the conduct of all branches of the petroleum industry was presented to the federal authorities, Hugh S. Johnson, federal industrial administrator, announced that as a result of the widely divergent views of various factions of the industry, the federal authorities would draw up a plan of their own. This code would regulate the producing and refining branches of the industry and would replace both the code decided upon in Chicago last month and the alternative code presented by Jack Blalock, of Marshall, Texas, said to represent independent elements of the industry. In making his announcement, Mr. Johnson also selected a committee of oil men to devise a new code for the marketing branch of the industry; this committee is working in conjunction with representatives of the federal government. Mr. Johnson's thought in setting up a committee to prepare a marketing code was that little difficulty would be experienced with this branch as the problems were similar to those confronting other industries whose codes had already been approved by the federal industrial administrator. Production and refining, however, presented an entirely new set of problems and in view of the fact that the industry was unable to settle its differences, a saving of time would be effected by the administration presenting its own plan rather than attempting to resolve the controversial points that had been brought up at the hearings.

Hearing on provisions of the oil codes before Hugh Johnson and his representatives began on Monday, July 24 and continued for three days during which each of the 29 sections of the combined producers' and marketers' codes drawn up at the Chicago meeting sponsored by the American Petroleum Institute, was considered and testimony of a purely factual nature was filed by representatives of the industry. A tremendous amount of testimony was filed during the three days of the sessions by representatives of all the important factions of the industry. In addition to the code drawn up at Chicago, Jack Blalock, of Marshall, Texas, submitted a code which was said to be favored by the independent elements of the industry operating in Texas.

Much of the testimony presented at the hearing dealt with the question of hours of labor in the oil industry, falling mostly along the lines indicated by the industry which desired a 40 hour week or along those indicated by the administration, favoring a 30 hour week.

Agreement on this point, however, would have proved easier than on the other two major questions: price fixing by the government and the lease and agency clause in the marketing code. At meetings of the committee and federal agents appointed by Mr. Johnson on July 27 to handle the marketing code, it was understood that the lease and agency practice by which companies bind service stations to sell their products exclusively, would in all probability be barred as unfair competition. Although the actual meetings of the committee have been secret, the trend prior to the formation of the committee seemed to indicate that this practice would be prohibited.

In regard to price fixing by the federal government, strong objections were urged by a large section of the industry. J. N. Pew, Jr., vice president, Sun Oil Company, in a very able paper presented in testimony to the National Recovery Administration objected emphatically to price fixing.

Price fixing for petroleum products by the federal government as well as the retention or rejection of the lease and agency practice are being considered by a committee, mentioned above as having been selected by Hugh Johnson, and consisting of the following members:

C. E. Arnott of the Socony Vacuum Corporation of New York, and Roy B. Jones of the Panhandle Refining Company of Texas, nominated by Axtell J. Byles, president of the American Petroleum Institute.

C. R. Starnes of Dallas, and F. C. Hart of New York, nominated by Jack Blalock, leader of an independent faction.

C. L. Shur and S. Messer, both of Oil City, Pa., proposed by the Pennsylvania Grade Crude Association.

Russell Williams for the Independent and Individually Branded Petroleum Marketers Association; Frank B. Bateman, for the Eastern States Independent Oil Dealers Association, and Tom Glasgow, for the Motor Equipment Wholesalers Association.

Every effort is being made to finish the marketing code during the first few days in August when the producing and refining code being drawn up by the administration will be ready. The codes will then be submitted to a committee, authorized to speak for the petroleum industry, for their consideration from which a final code for the entire industry will be evolved.

Moffet Slated as Chief Administrator of Oil Industry

A MAJOR development in the progress of the establishment of a code of fair competition is the reported selection of James A. Moffet, until recently vice president and director of the Standard Oil Company of New Jersey, as chief administrator of the United States petroleum industry, either heading a special board or under the direction of Secretary of the Interior Ickes. The significance of this selection is considered to be that Mr. Moffet's views in regard to the administration of the National Recovery Act are likely to favor policies supported by H. F. Sinclair, K. R. Kingsbury and others and opposed by Indiana and Jersey Standards, The Texas Corporation, Shell and Gulf interests.

James A. Moffet, son of a former president of the Jersey Corporation, vice president and director of that company and generally considered one of the most powerful figures in the company next to Walter Teagle, president, announced his resignation from Jersey Standard on July 28 following a disagreement with Mr. Teagle regarding the advisability of Mr. Moffet's serving on Hugh Johnson's advisory committee of nine. Mr. Teagle was already a member of this committee and is said to have considered it inadvisable for two executives of the Standard Oil Company to serve on the same committee. Mr. Moffet, on the other hand considered the invitation of Daniel C. Roper, Secretary of Commerce, in the nature of a command which he could not refuse to obey.

Balanced Utilization of Oil Products Needed

Crude Should be So Treated as to Limit Output of Fuel Oil to "Legitimate" Demand—Important Field of Development Offered by Diesel Engines.

By J. B. Aug. Kessler.

Joint Managing Director, Royal Dutch-Shell Group.

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J. B. Aug. Kessler

TODAY, crude oil is produced and treated primarily to meet the world's demand for gasoline: all other derivatives of petroleum are essentially by-products for which some offtake must be found. There are, of course, lubricating oils, bitumens and asphalts, and some special distillates for which there is an established demand but even these are none the less by-products in the sense that, from the residues remaining after the production of gasoline, many times the world's total requirements of these products could be obtained and, as the following statistics show, the production of these specialized products is relatively very small.

In 1932, in the United States, the amount of crude oil passed through the refineries was 872,661,000 bbl., in which has been included 26,332,000 bbl. of natural gasoline.

Derivatives Obtained From 1932 U. S. Runs to Stills

	Percent By Volume
Straight Run Gasoline	23.1
Cracked Gasoline	20.2
Natural Gasoline	3.1
Kerosene	5.2
Gas and Fuel Oils	34.8
Lubricating Oil	2.7
Coke, Asphalt, Loss, etc.	10.9
	100.0

The total production of gasoline amounts to 46.4 percent by volume of the crude oil treated and that of fuel and gas oils to 34.8 percent. Fuel oil is obviously therefore the most important by-product and the one with which I will deal more particularly.

For gasoline there is only what we may describe as a "legitimate" demand: any production in excess of this "legitimate" demand simply cannot be sold, even at low prices, and therefore is not produced. A word of explanation may be necessary as to why, in the case of gasoline there is only this "legitimate" demand.

Gasoline, a fuel of special properties, never acts as a substitute for other fuels. It may displace them but, in such cases, it does so only because of higher efficiency and generally greater suitability for the process involved. Any such replacement is obviously "legitimate" business.

For liquid fuel there is a "legitimate" and an "illegitimate" demand, and it is the latter which can be fulfilled only at very low prices. This dual market has enabled us carelessly to produce an excess of liquid fuel, thereby destroying our prosperity.

Before the days of cracking, an "illegitimate" demand for fuel oil was of little moment, but just as soon as this cheap liquid fuel became a raw material for the production of gasoline the danger arose, and with the modern development of the cracking process this danger is very real. Today cracking plants, even with a very liberal allowance for amortization, can produce gasoline at a cost price of not more than 2½ to 3 cents above the price of the raw material used. Therefore as long as liquid fuel suitable for cracking is sold at a price of 45 cents per barrel, or approximately 1 cent per gallon, the net return obtainable for gasoline cannot, for a period, exceed 3½ to 4 cents per gallon. Obviously it is impossible for the oil industry to maintain a sound, healthy condition, when the net return ex refinery for gasoline of first quality cannot exceed four cents per gallon.

The extremely low return obtainable for fuel oil requires no emphasis. It follows, of necessity, from the excessive production and from the fact that it has been imperative to secure markets for fuel oil irrespective of their financial value. The nature of these markets is of considerable importance.

The two chief fuels of the world are, oil—a liquid fuel; and coal—a solid fuel. Wood, gas and water power are of relatively minor importance since their use is restricted to a few areas only.

There are few applications where coal possesses special advantages but, definitely, there are applications where the peculiar properties of liquid fuel are not a real asset and where the solid fuel, coal, is in every way suitable. Apart from the requirements of a large number of modern ships, steam raising in large public and private buildings, and of some special industries, the use of a liquid fuel for under-boiler purposes is scarcely justified, since the peculiar properties of a liquid fuel are not used to the best advantage: coal meets adequately the requirements. While not applicable to all coal producing countries and particularly not to Great Britain, there are large areas where considerable quantities of fuel oil are consumed annually in under-boiler business, for example in stationary equipment on land for steam raising only, where the business has been secured in competition against coal previously employed purely on an oil/coal parity basis. In these cases oil possesses no real advantages and therefore the prices obtained do not include any premium for the peculiar properties of oil. This business has been sought and developed not because of any satisfactory return obtainable but simply as an outlet urgently needed to dispose of surplus fuel production. The thoughtless development of "illegitimate" markets has not and can never show reasonable financial returns.

Further, surplus fuel oil leads naturally to long term contracts at very low prices and therefore to a continuation of a ruin-

ous low price level of the raw material for cracking.

The harm for which these long term contracts are responsible does not end with their effect on the raw material from which gasoline is produced but, since they are commitments to deliver, the industry is compelled to continue the production of more crude oil than is economically desirable.

The raising of coal has been, and is today, in coal-producing countries one of their most important industries and it is an industry which has suffered not only from the general world depression but also from this thoughtless competition from petroleum fuel. Naturally prices have been forced down and not only has the sale of fuel oil become less and less remunerative but several governments of coal-producing countries have been compelled, or have considered themselves compelled, in self-defence and for other reasons to adopt measures in various forms, the nature and effect of which justify some little attention being given to them.

Because of continued research the efficiency of the oil industry has steadily increased and we have been able to produce gasoline and other petroleum products more and more cheaply. Our attempts to pass these lower and lower prices to the consumer have been completely frustrated by governments who have seen in them excellent opportunities for the imposition of fiscal taxes. Every reduction in price has been countered by increases in taxation of even greater magnitude by these same governments who have spent so much time and money in discussing schemes for improving the standard of life. Can anyone deny that low gasoline prices can assist greatly in the raising of the general standard of life? Yet the consumer has been deprived of the enjoyment of these low gasoline prices made possible by our own increased efficiency.

These taxes, while imposed for revenue, may be so easily misapplied as protective duties.

Is it not absurd that extremely low gasoline prices should indirectly, through excessive taxation, have been the reason for focussing attention on the very expensive and therefore uneconomical process of hydrogenation of coal and lignite? Interest in the hydrogenation of coal on the part of coal-producing countries grows apace and, apart from any selfish considerations of the effect of this process on the petroleum industry, it may not be amiss to consider for a moment the wisdom of this relatively new development, made possible only by excessive taxation of oil products.

It is claimed by those who support the development of coal hydrogenation that a country can be made self-supporting in its requirements of motor fuel, an asset said to be of the utmost value, particularly in times of national defence. Is this true?

Coal hydrogenation involves the construction of costly plant and equipment at a few points carefully chosen in relation to the sources of the raw material required, coal, and a distributing system based on these centres of production and radiating from them. In spite of military protection designed with the greatest care, these production centres must be exceedingly vulnerable and will logically be the special objects of repeated attacks by opposing forces. If destroyed or damaged in any vital part importation of oil products from abroad must be resumed, but then the whole system is disorganized. Importation involves the provision of ocean tank installations, which are then lacking. Distribution is based, not on importation through every suitable port on the coastline, but on a few radically different sources of supply and, therefore, just in times of emergency, distribution will be extremely difficult, since the system must be rearranged. Furthermore, many and wide-spread coastal supply points must be far less vulnerable to attack by a foreign enemy or revolutionaries.

The high taxation of gasoline focusses attention on cheaper alternative forms of fuel, and particularly on the development of the high speed Diesel engine. In this the authorities at once see a reduction in the revenue from gasoline and reimburse themselves by further taxation on Diesel oil and other fuels. The magnificent technical achievements of the past few years are deprived of their full realization and, by lack of imagination, these authorities tend to restrict and even to stop the marvellous economic developments this age has seen.

In the outrageously high taxation on gasoline and also on Diesel oil we have a particularly good example of the lack of wisdom and lack of foresight shown by those responsible for the government.

In railway systems, the application of Diesel engines on a large scale would do much towards solving the present railway problem involved in the acute competition against road transport. In the case of aircraft, the application of high speed Diesel engines would accelerate still more the development of this form of transport. Here are the fuels for prime movers of maximum efficiency, the unhampered development of which for road, rail and aircraft would increase the standard of living more than anything else, and yet the aim of governments seems to be to tax them out of existence.

Is the position of these new prime movers in relation to the amenities of life in any way different from that of the steam engine so many years ago? Should we have seen the wonderful increases in the standard of wealth in the nineteenth century, due almost entirely to the development of the steam engine, had this development been similarly restricted?

The nature of the business sought for fuel oil and the prices obtainable abundantly confirm the view that fuel oil is the by-product resulting from the treatment of petroleum which is produced in excess and even in great excess. In this the industry is responsible for its own failure and it would surely be wise to consider at once the measures necessary to curtail the production of this by-product, fuel oil, thereby removing the cause, apart from decreasing consumption, of the present unsatisfactory conditions.

The modern methods of treating crude oil involve two major processes. In the first place the crude oil is distilled or topped, yielding gasoline and, apart from minor by-products, fuel oil residue. A part of this residue is subsequently cracked to produce gasoline and further by-products. The majority of the cracking processes used may be divided into two main classes: —

a. Cracking to low-level or liquid residues, and
b. Non-residue operation, i.e. cracking to solid residue of coke.

In current practice, after topping, both systems of cracking are used and, keeping in mind the fact that primarily crude oil is topped and fuel residues are cracked to produce gasoline to meet the world's demands, a comparison of the by-products obtained for the same gasoline production, when running either of these cracking processes exclusively or when operating both as in current practice, may assist in our search.

The yields obtainable by different cracking processes obviously vary with the nature of the intake material, but the figures given below are comparable for one type of fuel residue.

Yield of Products from the Two Main Cracking Systems

Flashing or low-level runs

	Percent by Volume
Gasoline	41.16
Gas Oil	12.73
Fuel Oil	36.14
Gas	8.80
Coke (lbs. per bbl. input)	0.55

Non-residue or coke runs

	Percent by Volume
Gasoline	49.70
Gas Oil	14.51
Fuel Oil	7.72
Gas	14.00
Coke (lbs. per barrel input)	70.7

The U. S. Bureau of Mines statistics for 1932 show that, during the six months July/December 1932 (unfortunately figures for the whole of the year are not available), the total feed to the cracking plants in the United States was 192,810,000 bbl. From this was produced 44.1 percent by volume of cracked gasoline and 34.6 percent by volume of cracked fuel and gas oils.

Statistics are not available as to the relative quantities of cracked gas oil and cracked fuel oil or as to the average yield of straight run fuel obtained by topping crude, but the following figures are reasonable approximations:—

By cracking, 6.6 percent by volume of gas oil and 28.0 percent by volume of fuel oil;

By topping, 61.5 percent by volume of fuel residue.

Based on these figures and on the statistics of American production in 1932 already given it is possible to draw up the following table comparing, for the same gasoline production, the quantities of crude oil required and of fuel oil produced when operating:

a. By current methods, i.e. when *part* only of the straight run fuel produced by topping is cracked by residue and non-residue processes.

b. By cracking *all* straight run fuel according to current cracking methods, thereby removing all straight run fuel from the market.

c. By cracking *all* straight run fuel according to the low level system.

d. By cracking *all* straight run fuel to coke.

It will be appreciated that an accurate comparison of all four systems is impossible. The figures given in this table for systems "C" and "D" are comparable between themselves but, since the percentage yields given for low level and non-residue running, while correct for the particular refinery from which these figures were taken, are not necessarily the average yields obtained by these processes throughout the refineries in the United States, these figures cannot be accurately compared with those given for "A" and "B."

Quantities of Products Obtained from Crude Necessary to Yield 101.3 bbl. of Gasoline, by the Five Systems Outlined above

(Barrels)

System	Crude	Gasoline	Gas Oil	Cracked	Fuel Oil Straight Run
A	218	101.3	13.8	28.0	34.1
B	190	101.3	14.0	32.7	0
C	196	101.3	21.9	43.7	0
D	178.5	101.3	21.8	8.5	0
E	142.4	101.3	4.7	18.3	0

The basis taken has been the production of 101.3 bbl. of gasoline. This figure has no particular significance but is simply that obtained from the percentages given in the American statistics and proves to be a convenient figure for these calculations.

To make this survey more complete, figures have been added representing the results obtainable by hydrogenation of fuel oil and subsequent cracking of the gas oil so produced, are included. The processes involved in this last scheme are:—

a. Preliminary topping of the crude oil for gasoline, kerosene, gas oil and fuel oil as residue.

b. Moderate hydrogenation of the fuel oil residue in the liquid phase, adopting a once-through process. This is clearly the cheapest method of hydrogenation.

c. Distillation of the hydrogenated residue yielding a relatively small proportion of gasoline, about 15 percent by volume, a large percentage of gas oil and a small quantity of fuel oil.

d. Deep cracking of the hydrogenated gas oil by modern methods to obtain the maximum yield of gasoline and again a relatively small percentage only, approximately 15 percent, of fuel oil.

For the purpose of this survey the value of these tables is at once apparent. Several methods are indicated by which the present excessive production of fuel oil may be curtailed.

Theoretically these systems are capable of realizing the following reductions in the quantities of fuel oil available. Whether or no they are immediately practicable will be dealt with later.

1. The maximum possible reduction of 86 percent is obtainable by cracking all straight run fuel oil to coke.

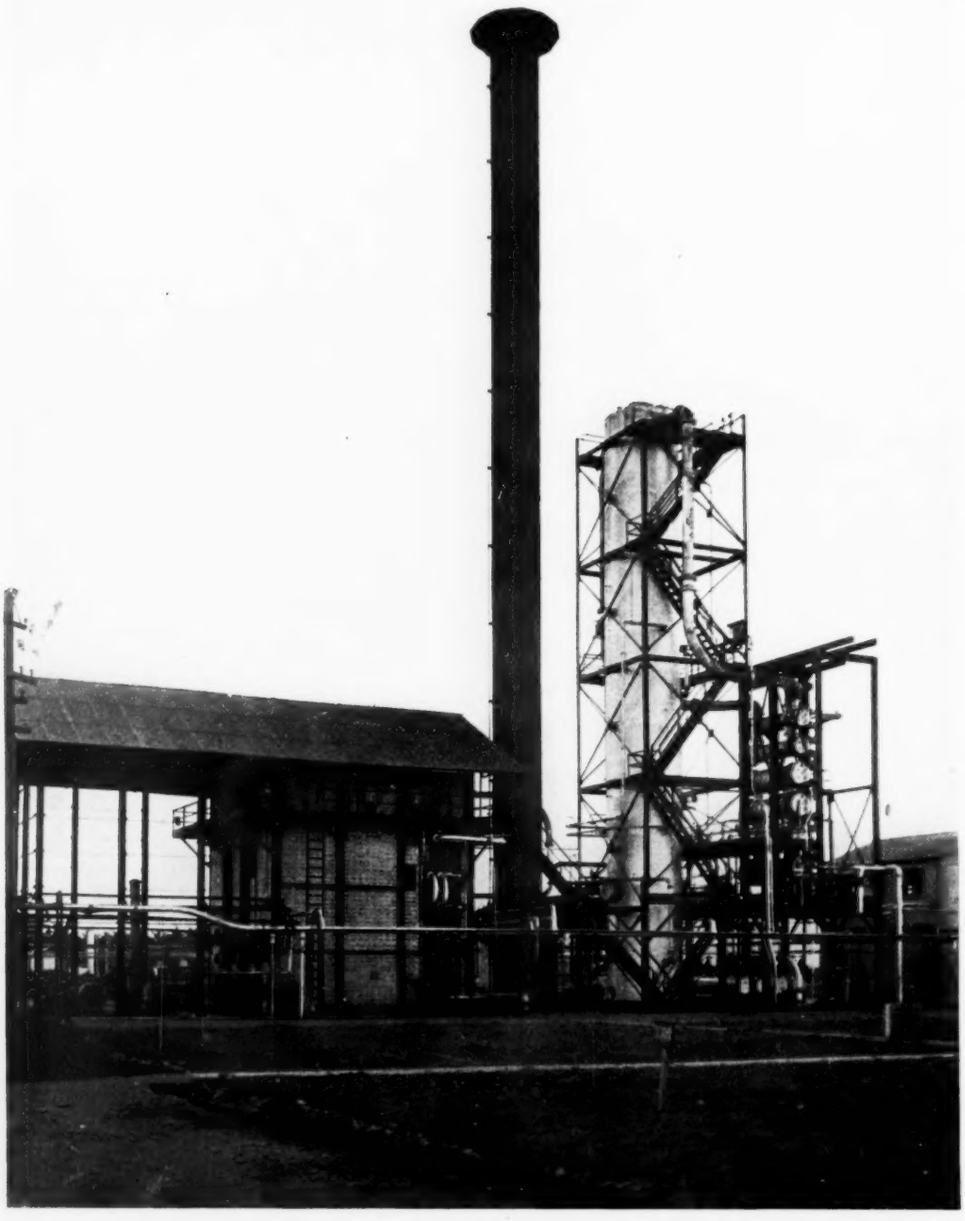
2. By a combination of hydrogenation and cracking a reduction of 70.5 percent can be secured.

3. By cracking all straight run fuel by current composite methods a reduction of 47 percent is possible.

4. By cracking all straight run fuel by the low level system a reduction of 30 percent is obtainable.

The maximum reduction of fuel oil can be realized by cracking all straight run residue to coke but it does not therefore follow that this system would be the most

Topping plant in Trinidad, owned by Trinidad Leaseholds, Ltd.: used to top crude for straight run gasoline and charging stock for cracking plant.



desirable or the most efficient. It is impossible to estimate the extent to which it is expedient to reduce the quantities of fuel oil available, since this depends so completely upon the relative and unknown proportions of "legitimate" and "illegitimate" fuel oil business already developed. When seeking to determine which business is "illegitimate," we must not overlook the fact that "illegitimate" competition is not always against coal; competition against some other fuels may be equally undesirable. For example, in California there are available abundant supplies of an excellent fuel, natural gas, but through unwise competition against this fuel, oil producers are compelled to sell their products at absurdly low prices. "Illegitimate" business is therefore not always against a less satisfactory fuel. It may, as in California, be against an even better source of heat and energy.

As long as fuel prices are uneconomically low there must be "illegitimate" business, but there must be no attempt to restrict in any way "legitimate" business. The only guide to the extent of the reduction permissible must be the price at which the fuel produced can be sold.

Reduction in Fuel Oil Production and Crude Oil Saving

System	Fuel oil reduction Percent	Crude oil saving Percent
B	47	13
C	30	10
D	86	18
E	70.5	35

While effective in securing the maximum reduction of fuel oil, it is well known that non-residue cracking involves the production of very large quantities of petroleum coke and gas. The market for gas is a local one only, and in the disposal of petroleum coke, the industry has already experienced considerable difficulty. This difficulty is not necessarily insuperable but, since the subject is one involving problems peculiar to itself, it merits separate treatment.

System "E," involving hydrogenation and cracking, is next in efficiency considered solely from the point of view of fuel reduction. In this case the problem of coke disposal does not arise but the hydrogenation of fuel oil is still in its infancy and it will be shown that the capital and operating costs are comparatively high.

System "C," cracking all straight run residue by the low-level method, is of least value both from the point of view of fuel reduction and crude conservation.

There remains System "B," namely cracking all straight run residue by residue and non-residue methods, as in current practice. This can involve no alteration in the present methods of cracking and probably slight additional capital outlay only. The relative extent of cracking by residue and non-residue processes will be governed as at present by geographical and other conditions, the local market determining whether the production of fuel oil or coke and gas will prove more remunerative.

Essentially System "B" means neither more nor less than cracking as much as is possible profitably.

The true value of this system can only be assessed by comparing, in addition, the relative operating costs involved.

Cost statements have not been prepared for systems "C" and "D." In the first place, as already explained, these two systems, while comparable between themselves, are not strictly comparable with systems "A" and "B" and, secondly, system "C" is least efficient from the point of view of fuel reduction and crude conservation, while system "D" involves the production of large quantities of coke and gas of which the industry cannot, at present, readily dispose.

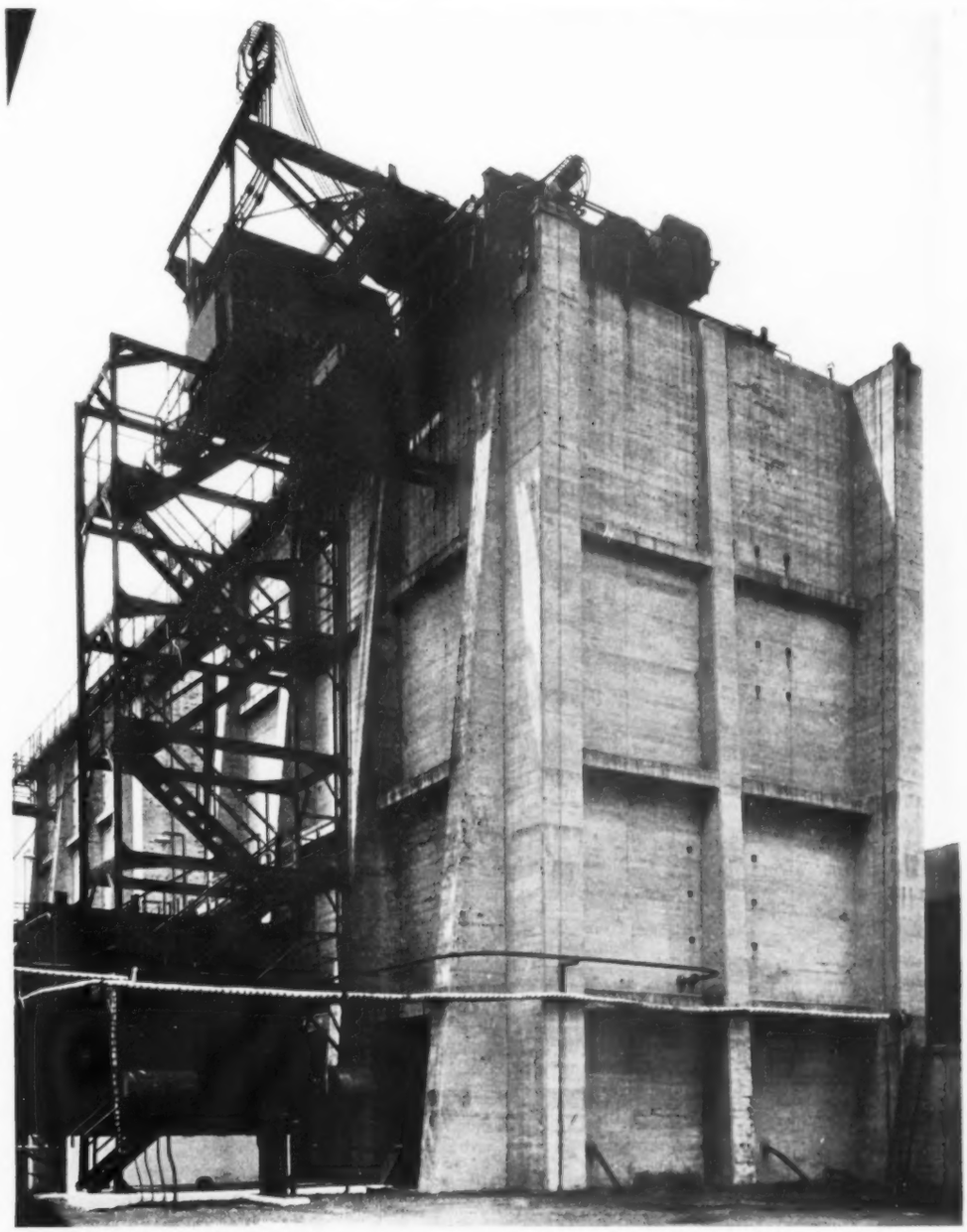
The figures given in relation to system "E" are provided in support of the statement already made that hydrogenation combined with cracking involves somewhat high operating costs.

The higher cracking operation cost in system "E" will be noticed and is accounted for by the fact that, in this case, we are cracking as deeply as possible to obtain the maximum yield of gasoline from the gas oil treated.

Cracking all straight run fuel by current composite methods would involve:

1. No change in operating methods.
2. Relatively small additional capital outlay.
3. A reduction of 13 percent by volume in the quantity of crude oil to be topped.

Hydrogenation plant at Bayway, N. J., owned by the Standard Oil Company of New Jersey: an example of the fifth refining system mentioned by Mr. Kessler.



4. A reduction of 47 percent by volume in the quantity of fuel oil available on the market.

5. The withdrawal of straight run fuel from the market.

The reductions referred to are maxima; modifications would be necessary to meet the market demand for lubricating oil, asphalt, and similar by-products but, since the quantities of these subsidiary by-products required are relatively small, the general principle would not be seriously affected.

We must not, however, overlook the position of gas oil in this scheme.

When operating system "B," the production of gas oil remains practically unchanged, namely 14.0 compared with 13.8, but, with the development of the use of the high speed Diesel engine, the demand for Diesel oil will become large. In this case system "B" will not produce an adequate supply of this by-product and a partial change to systems "C" or "D" or even to hydrogenation, particularly directed towards the production of gas oil, will be necessary. Even so, the principle remains unaltered. The changes made must be such as will maintain the requisite balance between production of gasoline, gas oil and the "legitimate" demand for fuel oil.

Point "5" alone, the withdrawal of all straight run fuel from the market, appears to be open to immediate criticism but this objection is not necessarily serious, although it merits careful examination.

Turning at once to the root of this problem, it must be accepted that, if the difficulties involved in the utilization of cracked fuel are difficulties of operation rather than, shall we say, scientific difficulties due to the fundamental composition of cracked fuel, the problem must be capable of solution and it is for the technologists of the industry to find the solution which is most practicable.

From the marketing section of the industry the disadvantages of cracked fuel have been stressed but, apart from certain minor problems, the chief difficulties appear to be:

a. The failure of cracked fuel to meet many current specifications, and

b. Practical objections based upon the known tendency of certain blended fuels to give rise to insoluble deposits.

Of these two, "a" is less important since, after all, many current specifications for fuel oil are based, not on the real requirements of the user, as determined practically, but on fuels found to give satisfactory results in the days when cracking was practically unknown or at least of small moment. Wholly cracked fuels having properties appreciably different from those required by the majority of accepted specifications have been and are being used in many cases with entirely satisfactory results.

The question of the development of insoluble deposits is one of greater difficulty but there appears to be no valid reason why a solution should not be found.

Experience has already shown that much can be done to reduce sedimentation by modification of the cracking processes. Changes from high-level to low-level running have in many cases yielded a marked improvement. Again, various methods have been evolved for the subsequent treatment of cracked residue and, as a last resource, when dealing with certain waxy straight run residues which, when cracked, yield unstable fuels, there is always the alternative of cracking to coke or of distilling down to asphalt, prior to cracking, and of cracking the distillate obtained. Blending of this asphalt with distillate in many cases yields a satisfactory fuel.

Some modifications of burning equipment may be necessary but there is considerable justification for claiming that, by slight modifications in plant running and by the choice of suitable cracked or straight run distillates for blending, it will be possible to produce satisfactory fuels, although with some charging stocks

Comparison of Operating Costs

SYSTEM A. (By current methods)

COSTS	
218 bbl. of crude @ 75¢ per bbl.	$163.50
218 bbl. Topped @ 8¢ per bbl.	17.44
100 bbl. Cracked @ 24.74¢ per bbl. (Operating costs 16¢ fuel oil 4.24¢ depreciation 4.5¢)	24.74
	$205.68
RECEIPTS	
Gasoline 101.3 bbl. @ $1.50 per bbl.	$151.95
Kerosene 11.3 bbl. @ $1.40 per bbl.	15.82
Gas Oil 13.8 bbl. @ $1.26 per bbl.	17.39
Fuel Oil 62.1 bbl. @ $0.45 per bbl.	27.94
	$213.10

Profit per barrel of crude 3.40¢.

SYSTEM B. (By cracking all straight run fuel)

COSTS	
190 bbl. of crude @ 75¢ per bbl.	$142.50
190 bbl. Topped @ 8¢ per bbl.	15.20
116.9 bbl. Cracked @ 24.74¢ per bbl.	28.92
	$182.62
RECEIPTS	
Gasoline 101.3 bbl. @ $1.50 per bbl.	$151.95
Kerosene 9.9 bbl. @ $1.40 per bbl.	13.86
Gas Oil 14.0 bbl. @ $1.26 per bbl.	17.64
Fuel Oil 32.7 bbl. @ $0.45 per bbl.	14.72
	$198.17

Profit per barrel of crude 6.08¢

SYSTEM E. (Hydrogenation followed by cracking of the gas oil)

COSTS	
142.4 bbl. of crude @ 75¢ per bbl.	$106.80
142.4 bbl. Topped @ 8¢ per bbl.	11.39
87.6 bbl. hydrogenated @ 72.57¢ per bbl.	63.57
73.05 bbl. cracked @ 31.73¢ per bbl. (operating costs 18¢ fuel 4.73¢ depreciation 9¢)	23.18
	$204.94
RECEIPTS	
Gasoline 101.3 bbl. @ $1.50 per bbl.	$151.95
Kerosene 7.4 bbl. @ $1.40 per bbl.	10.36
Gas Oil 4.7 bbl. @ $1.26 per bbl.	5.92
Fuel Oil 18.3 bbl. @ $0.45 per bbl.	8.23
	$176.46

Loss per barrel of crude 20.0¢

Summary of the Figures Obtained for Systems "A", "B" and "E"

	Fuel Oil Reduction (Percent)	Crude Oil Saving (Percent)	Profit or loss per bbl. crude (cents)
SYSTEM A			
Current system	....	..	+ 3.40
SYSTEM B			
Cracking all S. R. fuel	47	13	+ 6.08
SYSTEM E			
Hydrogenation	70.5	35	−20.0

Cracking unit at Tampico, Mexico, recently built by M. W. Kellog for the Huasteca Petroleum Company: this plant produces a liquid residue.

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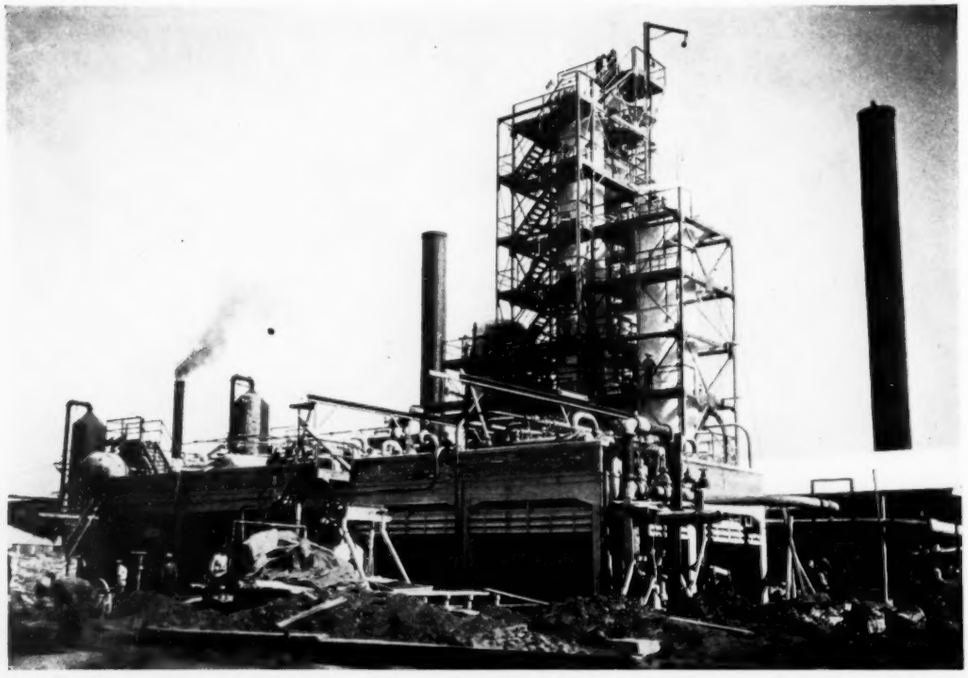


cracking to coke or distillation to asphalt and subsequent cracking of the distillate may be necessary.

The suggested scheme of withdrawing all straight run fuel oil from the market and of curtailing the amount of liquid fuel available so as to balance production with the legitimate demand involves a change in outlook but appears to be free from any serious fundamental defects. The advantages to be gained would go far towards raising the oil industry from its present unremunerative state. Coupled with conservation of crude we should more nearly approach the balance between production and consumption of each product individually, a balance which is essential to a healthy state of the industry.

The removal of, or rather omission to provide, part of the liquid fuel at present on the market, if necessary up to a reduction of 47 percent, would at once have the following results:

a. Fuel oil prices would be raised to a reasonable and remunerative level.

b. Cheap under-boiler fuel business would be returned to coal by which such business was originally held. There would then be a cessation of any real or apparent justification for the restrictive measures adopted by coal producing countries for the protection of their national industries.

There would, too, be less inducement to coal producers to seek such essentially abnormal outlets as coal hydrogenation for their product. The danger of an artificially created new supply of gasoline by coal hydrogenation would exist only in so far as nations may wish to insist on this expensive method of gasoline production for the doubtful security of a national supply in times of home defence. The questionable value of this expedient has already been proved.

c. The supplies of fuel oil being limited, its use would be restricted to those applications where the special properties of a liquid fuel are of real value. These we may term "legitimate" applications for which the consumer would be prepared to pay "legitimate" prices.

d. By permitting the oil industry a reasonable return for its produce and labor, the consumer would be guaranteed a supply of petroleum products of the constantly improving quality rendered necessary by modern progress in design, unless, and this is of the greatest importance, this is rendered impossible by government taxation. Such taxation must ruin the prosperity technical science can give to the world.

e. The life of the crude oil resources of the world would be prolonged, since less crude oil would be required to meet the world's growing demand for gasoline and gas oil.

f. Production and drilling costs would be curtailed.

We have on one side of the balance sheet a moderate capital expenditure on additional cracking equipment but this expenditure cannot be considerable. A simple calculation serves to show that the maximum increased cracking necessary cannot exceed 17 percent. On the other side, we have direct savings in production and drilling costs and, of even more importance, by restricting fuel oil to its legitimate markets, the fuel oil market becomes reasonably remunerative and ceases, through cracking, to destroy the gasoline price structure. Finally, by the indirect improvement in the value of crude oil the deplorable position of the smaller oil producers is at last remedied.

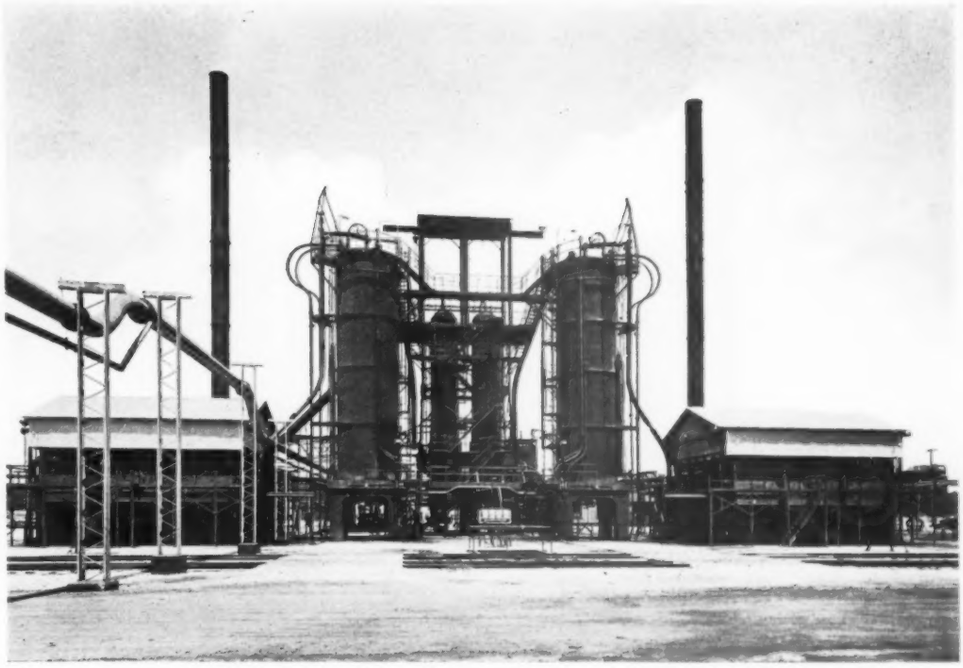
This survey has shown that, by modifications in its present wasteful methods, the oil industry can itself very largely extend the advantages to be gained by crude oil conservation. By balancing production and consumption, not of petroleum products as a whole, but of each product individually and particularly of fuel oil (the only product for which there is an "illegitimate" market) by the application in fact to all products other than gasoline of the balancing control which operates automatically in the case of gasoline, a healthy state of the industry can be gained.

The gradual increase in the percentage of cracked fuel present in marketed fuel oil blends indicates that already this suggested system is beginning to operate but, like all unmanaged processes, its development is too slow. Why should we delay?

From 1929 until the beginning of this year crude conservation has been in operation and yet, during this period, prices have dropped to a deplorable extent. Why wait until this rationalization is at great cost slowly forced upon us and until all the dangers for which low priced fuel oil can be responsible are realized? The solution is practicable, the advantages are real and the truth so obvious that, while conservation may lead and point the way, the goal can never be reached without the assistance of this rationalization.

Let us begin at once to balance each product for itself, and particularly to stop this over-production of fuel oil, the Evil Spirit of the industry. Let us crack to the maximum extent wherever there is a profit reducing, if necessary, the production of crude oil accordingly. Just so soon as this balance between production and the legitimate consumption of fuel oil is gained so soon will the industry be out of the present morass.

Condensed from a lecture delivered before the World Petroleum Congress, London, July 20, 1933.



Dubbs cracking unit at Houston, Texas belonging to Shell; this unit is capable of producing either liquid or coke residue without additional equipment.

Cover Picture

OUR FRONT COVER picture this month is a striking illustration of the Shell-Mex House completed earlier this year. The photograph is taken from the river looking through the rigging of an old sailing vessel and over the trees of the Embankment, and in addition to showing the severe attractiveness of the lines of the building, which is one of the most modern in construction, in the city of London, the photograph shows the famous clock in the tower atop the building. In this building the vast marketing organization of the Shell-Mex is housed presiding over a considerable section of the often troubled British petrol market.

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Progress of French Monopoly Checked

An Attempt on the Part of the Socialist Party to Establish a Petroleum Monopoly Has Been Temporarily Defeated by Opposition from the Senate and a Government Crisis.

BEFORE the French Chamber and the Senate could be brought to an agreement over the insertion of a clause concerning the oil monopoly (Article 116) in the Budget Bill, Mr. Daladier's government was in a critical position. Foreign affairs, however, coupled with a stroke of genius on Mr. Daladier's part saved the situation, for even the Socialists realized that they could not overthrow the government, in order to be sure of obtaining an oil monopoly, on the eve of the signature of the Four Power Pact and of the assembly of the World Economic and Disarmament Conferences.

The mechanism devised by Mr. Daladier was simple enough; it consisted in changing the wording of Article 116 appointing a commission to determine the conditions under which an oil monopoly could function in France, so as to make it acceptable to the senate: thus a truce was established between the two Assemblies and a government crisis was avoided.

The actual vote on this troublesome bill took place on June 1 and Article 116 worded as follows:

> Within three months' time from the date of the promulgation of the present Act, a Commission will *determine* the practical conditions for organizing a monopoly of imports and petroleum and the possibility of establishing a monopoly of refining in France.

became Article 117 worded thus:

> Within three months' time from the date of the promulgation of the present law, a Commission will *investigate* the practical conditions for organizing a monopoly of imports of oil and petroleum and the possibility of establishing a monopoly of refining in France, *in order to submit them to the attention of Parliament.*

Since that date all parties have made feverish arrangements to be represented on the Commission which is composed of six Senators, and thirteen Deputies, seven other state representatives and four representatives of the consumers and users of petroleum products.

The persons chosen are the following:

THE entire international petroleum industry is watching with keen interest the struggle in France to reverse an established policy in regard to petroleum by the introduction of a clause creating a monopoly in the budget bill. Effective opposition has been organized in the Senate, however, and the clause establishing a monopoly has been changed to a clause establishing a commission to investigate the possibility of such a state monopoly. The French government, in the past, having deliberately encouraged a large refinery program, the outcome of the struggle is being closely followed by interested international companies who have acceded to France's wishes in rushing the work of construction of the Iraq pipeline. Completion of this project will assure an independent supply of crude to France, her ultimate goal; but a strong voice in the progress of the work is held by the very companies which would be most deeply injured by the reversal of French policy in regard to petroleum.

SENATE REPRESENTATIVES:
Senator Henri Roy (Chairman of the Board of the Office National des Combustibles Liquides), Farjon (Finance), Charles Dumont (Foreign Affairs), Messimy (Army), Duroux (Commerce), Louis Tissier (Mines), Boivin Champeaux (Civil and Criminal Legislation).

DEPUTIES' REPRESENTATIVES:
Pierre Deyris (Finance), Maxence Bibié (Foreign Affairs), Adolphe Chéron (Army), Morinaud (Navy), Julien Durand (Commerce), Renaitour (Air), Maxence Roldes (Agriculture), Charles Baron (Mines), Mendès-France (Customs), Tasso (Mercantile Marine) Ernest Laffont (Final Accounts), Alexandre Varenne (Public Works), de Nadaillac (Civil and Criminal Legislation).

OTHER STATE REPRESENTATIVES:
Berget (State Councillor), Hoschiller (Under Secretary of State for National Economy), Blanchard (War Office), Merouze (Ministry of Marines), Escallier (Finance), Haguenin (Budget), Galliot (Public Works).

CONSUMERS' REPRESENTATIVES:
De Rohan (Chairman of the Automobile-Club de France), Mole (Chairman of the Chambre Nationale du Commerce de l'Automobile), Monprofit (General Secretary to the Fédération Nationale de l'Automobile, du Cycle, de l'Aéronautique and Related Industries), Poisson (Vice-Président of the Conseil National Economique).

The first meeting of the Petroleum Monopoly Commission was held on July 5 and was presided over by Mr. Guy La Chambre, Under Secretary of State who immediately appointed as secretary to the Commission, Mr. Hamelin, Councillor to the Cour des Comptes, and two under secretaries, Mr. Favier, Auditor to the Cour des Comptes, and Mr. Roger Conte, attached to the Cabinet of the Under Secretary of State.

There then followed a heated discussion as to ways and means and it was finally settled that no decisions could be taken until a report on the existing conditions of the French oil industry had been presented which could serve as a basis for the studies of the commission.

This is all the more necessary because the members of the commission have not, unfortunately, been chosen for their competence in oil matters. Each Parliamentary Commission nominated a representative according to its views, favorable or unfavorable, to the Monopoly.

The opinions of the Commission are, therefore, no longer a secret; unfortunately for the oil industry, the Chamber of Deputies has the largest number of representatives and, as has already been explained, the Socialists are in the majority, thus it is pretty safe to reckon that out of 19 Parliamentary members 13 may safely be considered as favorable to the Monopoly. The other seven State Representatives will, in all probability, follow the government. The four remaining representatives of the users and consumers will doubtless consider the interests they represent, whatever their political tendencies may be,

and do their small best in face of such odds.

What must forcibly strike the reader, as it has every one else, is that there is no representative of the interests most at stake, that is to say of the *oil industry itself*, on the commission. Objections have been raised to this omission as being both unfair and undiplomatic but it is largely a result of the lethargy with which the representatives of the industry have so far treated the question. Before discussions took place at the Chamber, they trusted that the bill instituting the Commission would not pass; now that it has done so, they are counting upon the vote of the Senate to ward off the final blow. It is a mistake, a very great mistake, the gravity of which they are likely to appreciate in the autumn if they do not make up their minds to act promptly and efficiently.

Outside pressure can still be brought to bear, the public can be enlightened. Every gasoline station in France can be an educational center on this subject, if instructions emanate from headquarters. But a united front is necessary and that unfortunately seems to be the one thing that is sadly lacking.

The second meeting of the Petroleum Monopoly Commission was held on July 19 when Mr. Pineau, Director of the Office National des Combustibles Liquides, read his report on existing conditions in the oil industry which is to serve as a basis for the members of the Commission to work upon. A great deal depended upon Mr. Pineau's report—he is said to be against a Monopoly—however, his position is delicate. He is flanked on one side by his President, who is frankly against the Monopoly, on the other by his Minister, Mr. Serre, who will, of course, side with his colleagues of the Government. Under the circumstances, a very objective report was a necessity, a report that favored neither side of the subject.

Pending this report, readers will be interested to hear that the oil press in France has expressed the opinion that certain members of the Commission are inclined to favor an extension of 1928 legislative measures, that is to say that the control of imports may well be extended to a financial control. Should this happen, the state would regulate purchase prices and sales prices and then take for itself the margin of profit.

This solution to the problem appears to the writer to augur no good to the oil companies operating in France. They will be faced with a Monopoly but will the state give them an indemnity unless it actually takes over the existing organizations, refineries, etc. . . ?

That is a question which deserves to be closely examined.

▼

Coal Hydrogenation Wins Britain's Support

Government Proposes to Guarantee Preferential Treatment to Oils Derived from Indigenous Products—Plant with Capacity of 100,000 Tons Yearly Planned for Early Erection

LONDON, JULY

CARRYING further its efforts to revive the decadent English coal industry the British Government, which already has imposed various taxes favoring coal at the expense of oil for use as fuel, now proposes to extend a direct subsidy to the production of petrol from coal by the hydrogenation process. This project was put before the House of Commons on July 17 by the Prime Minister and probably will be adopted very shortly.

Essential features of the proposal are that light hydrocarbon oils manufactured in Great Britain from indigenous coal, shale or peat, or from products derived from those substances, are to enjoy a preference over imported oils which is guaranteed to average not less than 4d per gallon for the next nine years from April 1, 1935. A figure of three shillings (36d.) has been adopted as the guaranteed total of the preference for a 10-year period, but the actual amount will depend upon the duty charged against petrol imported or produced from imported oil. At present this duty stands at 8d. per gallon and if it remains at this level the products of coal hydrogenation will enjoy a guarantee of protection to this extent for a period of four and a half years. Should the petrol tax be reduced to 4d. the guaranteed preference would extend over a period of nine years. Apparently the government has no present intention of reducing the petrol duty so that it is safe to assume that the production of petrol from coal will start off with a definite advantage of 8d. per gallon as compared with the imported product.

While the proposed subsidy will apply to coal, shale or peat and to all processes for deriving oil from these sources the immediate object of the proposed legislation is to establish the production of oil fuels from bituminous coal by the hydrogenation process. Experiments in this direction have been carried on for the past six years by Imperial Chemical Industries Limited which holds British hydrogenation rights. These experiments have been watched with sympathetic interest by the government which has been seeking by every means possible to sustain the coal industry, long regarded as the backbone of British industrial organization, and to provide more employment for British miners.

While the possibility of producing various oils from coal by methods of hydrogenation has been fully demonstrated in Germany the feasibility of introducing the system into Great Britain has been much discussed. The higher cost involved admittedly precluded commercial exploitation except with direct or indirect state assistance. Various estimates have been made of the difference in costs. One generally accepted was published in the London TIMES several

months ago by Prof. H. T. Tizard of the Imperial College of Science and Technology. In the course of this statement Prof. Tizard said:

About four tons of coal are needed to produce one ton of petrol; this corresponds to a thermal efficiency of about 35 percent, which may possibly be increased to 40 percent. In other words, 35 percent to 40 percent of the heat units contained in the coal taken into the plant reappears in the form of marketable petrol, and 60 percent to 65 percent of the heat units is dissipated in the process. The thermal efficiency of the production of petrol is thus higher than that of the production of electricity, but the capital cost, on a thermal basis, is also higher. Using this comparison, I deduced that the cost of producing petrol from coal by hydrogenation would be at least 9d. a gallon, allowing for a small interest on capital. The same figure has been given by Sir Frank Smith in a recent lecture. The present average wholesale price of imported petrol from natural sources is less than 5d. a gallon, and last year it was for a period less than 3d. a gallon.

One of the arguments used in support of coal hydrogenation has been that it would be of considerable benefit in relieving unemployment. On this subject Prof. Tizard wrote:

A plant consuming 800,000 tons of coal a year and producing 200,000 tons of petrol, which is only a little over one-twentieth of present needs, would have to be subsidized, directly or indirectly, by the taxpayer to an extent of about £1,000,000 a year for at least 10 years—otherwise it could not compete with imported petrol. It would only, directly or indirectly, employ some 5,000 men, so the effect on unemployment of the operation of the plant would be negligible.

Immediately following Prime Minister Macdonald's statement of the intention of the government to extend assistance to the coal hydrogenation movement, announcement was made by Sir Harry McGowan, chairman of Imperial Chemical Industries Ltd., that the company would provide new capital of about £2,500,000 for the early erection of a plant for the production of oil from coal. This statement, after referring to the experimental work conducted by the company, added:

In view of the undertaking given in the House of Commons the directors of Imperial Chemical Industries, Ltd., have now authorised a scheme for the erection of a large commercial plant, which is to be located at the company's works at Billingham-on-Tees, Durham, where special facilities are available.

An initial output of 100,000 tons a year of first-grade petrol is aimed at by processing 400 tons of coal a day and using altogether about 1,000 tons a day of coal.

The operation of the plant will give permanent direct employment to 2,500 miners and other workers, as well as much indirect employment. The construction of the plant itself, estimated to take about one and a half years, will call for much activity in the iron and steel and heavy industries.

Seven thousand men will find direct employment during this one and a half years, and it is expected that there will be indirect employment for a further 5,000 men.

While the petroleum trade naturally is not enthusiastic over a project that will cut further into their field of operations in this market, it is unlikely that serious opposition will be raised to the adoption of the government's plan. Such opposition in any case probably would be futile. There is a general feeling that in view of the constant agitation of the subject, it is well to allow the actual commercial possibilities of coal hydrogenation to be determined. The extent to which petrol from present sources will be displaced by the projected plant of Imperial Chemical Industries Ltd. is only about 2½ percent of the present total demand, but of course there is a possibility that other plants may be erected or that other processes will be brought forward to share in the preference. The loss in revenue to the Treasury from the remission of duty on 100,000 tons at the present rate will be roundly £1,000,000 per annum.

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Increase in Motor Fuel Demand of 2.9 Percent Forecast for Second Half of 1933

FORECASTING a demand for 2,362,000 bbl. of domestic crude daily through the second half of 1933, the American Petroleum Institute's Committee on Refinery Statistics and Economics, headed by D. J. Moran, has completed its report for the second half of 1933. Of the demand for 2,362,000 bbl. of crude daily, 100,000 bbl. daily is indicated as a desirable reduction in inventories. Daily runs to stills are placed at 2,308,000 bbl. and stocks on December 31, 1933, should not exceed 46,500,000 bbl. of motor fuel, which would be 7,305,000 bbl. less than on the same date in 1932.

Referring to crude production, the Committee sounds a warning that at present, inventories are increasing at an alarming rate due to production in excess of daily requirements and calls attention to the fact that production was kept approximately within the limits of demand during 1932 and the first quarter of 1933. After that period production began to exceed demand creating a burden beyond the ability of the industry to bear.

Increase in domestic motor fuel demand of 3.0 percent and a slight decrease in exports will bring the total demand for motor fuel to 2.9 percent above the corresponding period of 1932. This is taken to indicate an improvement in general business conditions. Factors affecting the export of motor fuel will continue in force but to a lesser extent.

Motor fuel stocks have been below those of the preceding year and the trend toward more economic inventories continues. The report emphasizes the importance of allowing inventories to reach economic levels by the end of the peak consuming period and of allowing for nominal increases from then until the end of the year.

Gas and fuel oil supply is deemed sufficient to meet the demand of the logical markets for these products to the end of the year.

The report is submitted by the Committee on Refinery Statistics and Economics of which D. J. Moran is chairman and A. J. Byles, C. L. Suhr, E. G. Seubert, E. B. Reeser, T. H. Barton, H. C. Wiess, T. A. Dines, and K. R. Kingsbury are members.

▼

Michigan Production

DUE to an oversight in preparing the article on Michigan oil production, entitled, "Important Michigan Production," for the July issue of WORLD PETROLEUM, the name of the author, Mr. C. G. Carlson, consulting engineer, Tulsa, Oklahoma, was inadvertently omitted. Mr. Carlson wrote this interesting article especially for WORLD PETROLEUM after an extensive trip through the oil producing sections of Michigan and we wish to take this occasion to express our regret for the omission.

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Ethyl Margin Cut

REDUCTION to two cents of the price margin between Ethyl gasoline and regular brands is announced by the Ethyl Corporation. The reduction in the price of Ethyl fluid sold to refiners has been made with a view to stimulating demand for premium motor fuel in anticipation of the increased consumption that is foreseen as accompanying the economic recovery.

Following this announcement, Standard Oil Company (Indiana) reduced the price of Red Crown Ethyl one half cent a gallon establishing a two cent premium for Ethyl on July 26.

World's Fourth Most Powerful Gusher

Lok Batan No. 45 Proves Importance of Puta Region which Will Come Under Intensive Exploitation and Promises Vast Future Production in Accessible Region.

By A. Perms

Senior Geologist, Azneft

FLOWING 140,000 bbl. of high grade crude per day, well No. 45 at Lok Batan comes as the climax of intensive exploratory work by Soviet geologists using the most modern methods of geological exploration and persisting in the face of the theory that commercial production could not be found in connection with the mud volcanoes that dot this region. Lok Batan is situated in the Puta region and is under the control of Molotoff oil field (Azneft) which includes Puta proper, Kergez, Shubani and Kushkhanin areas. The oil fields of the Puta region have been developed only after nationalization, when the industry underwent radical reorganization, and careful exploration has led to the belief that this is one of the richest oil regions in Russia. Geologists working in this area, in addition to using modern methods of exploration, made a practice of reporting on formations situated at depths to 3,300 ft. in the greatest detail.

The axis of the great anticlinal fold in the Shubani field stretches north and south turning sharply in an easterly and westerly direction in Bibi-Eibat area and continuing through Lok Batan, Puta, Kushkhanin and Kergez. Along the arch of the fold numerous mud volcanoes and dome-shaped structures are found.

Lok Batan, Puta proper, and Kergez are the richest oil fields in the Puta area, located along the arch of the anticlinal fold. In Lok Batan, where the most striking recent results have been obtained, nine separate horizons have been discovered so far and of these only the upper zone has been thoroughly explored, the lower horizons having hardly been touched. Well No. 45 is producing from the central zone. The field has been developed for exploitation in the record time of only two years and the field covers an area of 800 hectares. Eventually at least 800 wells can be drilled in this area. Of the five horizons opened to date the second and fourth have proved to be particularly rich in oil. Well No. 45 is clear proof of the reserves of the central zone. Beyond the zone from which No. 45 is producing, the deeper formations have not yet been touched.

Important production is anticipated from these deeper horizons, based on the results in the Bibi Eibat field where wells have been drilled 1,750 ft. below the top of the deep producing zone making Bibi Eibat of tremendous importance as a field with average cumulative production to date reaching 1,274,000 bbl. per hectare. Well No. 35 in Bibi Eibat, in the seventeenth horizon, which blew in as a powerful gas producer, is now flowing high grade, light crude.

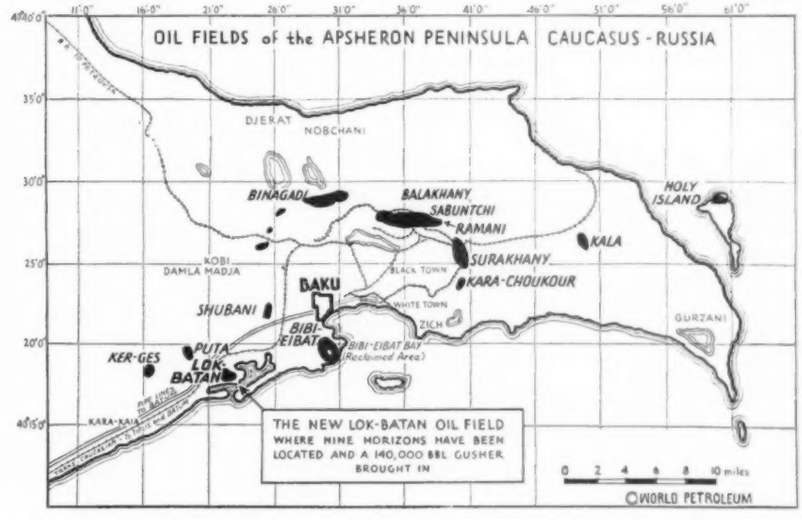
In Puta proper, the second important field in this group, five horizons are under exploitation covering an area of 170 hectares with reserves calculated as sufficient to justify the drilling of 100 wells. The field was handed over for commercial exploitation in 1925 and has at present 45 producing wells and 11 wells drilling. Wells drilled to the central zone (corresponding to that from which Lok Batan No. 45 is producing) produce at the rate of 2,100 to 2,800 bbl. daily. Lower horizons here too, are expected to show greater production; well No. 322 producing from 2,415 ft. yielded approximately 5,000 bbl. per day. Geologists are attempting to open the deeper horizons and are sinking well No. 71 for this purpose.

Kergez, third of the more important fields in the Puta group, has an area of 100 hectares where 71 wells will be drilled. Six wells have been completed and the seventh is presently drilling. Here again the central zone is considered the most important with well No. 96 producing from it at the rate of 17,500 bbl. daily. Other wells in Kergez produce 2,000 bbl. to 3,000 bbl. daily from upper horizons.

Altogether the Puta area includes 1,071 hectares of proven area where at least 1,000 wells will eventually be drilled.

Production of this region has been increasing from month to month, Puta proper having yielded 46,900 bbl. in the first year (1925); in 1931 Puta and Kergez produced 1,372,000 bbl.; and in 1933, 2,643,900 bbl. are to be produced from these two fields. Lok Batan, the richest field in this group, has not yet reached the first stage of industrial development, having only 10 exploitation wells. By May 31, however, production amounted to 2,450,000 bbl. and the Lok Batan field having already outstripped the old Bibi Eibat field, where there are 650 producing wells, promises to surpass Ordjonikidze, richest field of Azneft.

Exploration in the Puta region has had a twofold result: it has opened a great future for the Puta group and has prepared a rich oil reserve for industrial exploitation.



Lower Earnings Accompany Improved Quotations

Decreased Consumption, Lower Average Product Prices and Overproduction Contrast With Higher Share Quotations, Indicating Renewed Hope for Future Earnings. ***By C. C. Bailey***

COMPARISON of recent market quotations for representative American oil shares with the low prices for the year to date and with average levels of 1932, reveals an advance such as might logically be expected to reflect a substantial improvement in the fundamental economic status of the industry. In contrast thereto the half-year financial reports that have thus far appeared show almost without exception a lower rate of earnings than the same period of 1932.

For example, Atlantic Refining shares last month reached a high of 31⅞, compared with this year's low of 12⅜ and with a 1932 range of 21⅞–8⅝; yet the first six months of this year yielded a deficit of $2,322,000 (exclusive of nonrecurring profits), compared with a profit of $3,185,000 in the same period of 1932. The attached tabulation includes other similar illustrations, and one instance where a higher net was reported.

The direct and proximate reason for the lower earnings is not difficult to determine and the tenor of results was not unexpected by those who have followed developments in the industry closely. Although there are now indications of a turn in consumption of oil products, the half-year demand continued the downward trend of the past two years and was moderately below the first half of 1932; and in addition there was a lower average price structure due to renewed overproduction of crude oil and a substantial volume of "bootleg" oil and gasoline.

The latest available oil statistics from the Bureau of Mines cover May and reveal that total gasoline demand for the first five months of the year was 154,457,000 bbl., a decline of about 4½ percent from the same period of 1932, and that total demand for all oils at 374,823,000 bbl. was more than three percent lower.

According to the Bureau of Mines, domestic crude oil production in May averaged 2,734,000 bbl. daily, the highest monthly rate since October of 1929 and an increase of 46 percent over the 1,872,000 bbl. daily of last December; June and July output continued near the higher figure. This increase reflects failure of production control machinery to control, especially in East Texas, and clearly represents an excessive output when compared with estimates made late last year and in the spring of this year by the Economics Committee of the American Petroleum Institute and the Federal Oil Conservation Board that 2,000,000 bbl. daily would be adequate for all reasonable needs and to accomplish a moderate reduction in the heavy inventories of the industry. Such an excess might perhaps have been absorbed into storage without exerting undue pressure on prices (if not too long continued), but there has been more or less continuously a substantial volume of "hot oil" produced in violation of proration orders, much of which may not have been recorded in the statistics.

Refinery prices of gasoline at refining centers averaged 3.56 cents per gallon during the first six months of this year, a decline of 26 percent from the average for the first half of 1932, of 31 percent from the average for the entire year 1932, and of 23 percent from 1931, which was a very poor year for the industry.

These price differentials constitute sufficient basis for the earnings declines reported, and taken in conjunction with the statistics of consumption previously quoted suggest the conclusion that the oil industry's problem is not one of reviving consumption but of correcting evils and abuses that undermine the price structure. Looked at from this point of view, the contrast between market action of oil shares and their earnings mentioned in the opening paragraph raises the question as to what prospects may be visualized for remedying the price situation and thus comparatively quickly restoring earning power to a more equitable level.

The rate of decline in gasoline consumption showed definite slackening in the first half of this year, and evidence of a turn is found by the committee of the A. P. I. which estimates that gasoline demand in the final six months of 1933 will exceed the latter half of 1932 by 2.9 percent. Although not as vital as the price problem, a resumption of the uptrend in gasoline consumption will be a constructive factor for the industry. There is also another internal factor supporting a hopeful attitude, namely the evidence in East Texas that that prolific field will soon have passed its peak of potential.

The remarkable psychological change in the American public in the past four months has translated these constructive factors in the outlook for the oil industry into a substantial advance in oil share quotations, a process which has also been evident in other groups and which recently reached patently excessive proportions in the so-called repeal stocks. It is getting rather late in the year for the oil industry, which declines seasonally in the fourth quarter, to register a sufficient improvement to make the 1933 earnings statements show many surprising gains over last year, but there are many reasons for looking to 1934 with hope and confidence that a reasonable rate of return on the country's $12,000,000,000 investment in the oil industry may be reestablished through intelligent participation by the members of the industry in the program and course they have helped to mark out.

Oil Share Quotations Compared with Earning Statements

Company	July 1933 High	July 1933 Low	1932 High	1932 Low	Net earnings—six months 1933	Net earnings—six months 1932
Atlantic Refining	31⅞	12⅜	21⅞	8⅝	d$2,322,000	$3,185,000
Seaboard Oil	33⅞	15	20⅜	6⅝	513,086	374,810
Simms Petroleum	12⅜	4⅞	7½	3¼	d413,000	d287,158
Sun Oil	50	35	39⅞	24¾	1,138,982	2,030,918
Tide Water Assoc.	10¾	3⅛	5⅝	2	174,355	2,009,700
Union Oil	23⅝	8½	15⅜	8	d1,150,000	1,500,000
Continental Oil	19½	4⅞	9⅜	3⅝	d4,961,000	256,502
Phillips Petrl.	17⅞	4¾	8½	2	d5,324,600	812,500

d = deficit.

World Oil Production—Official Figures for 1933

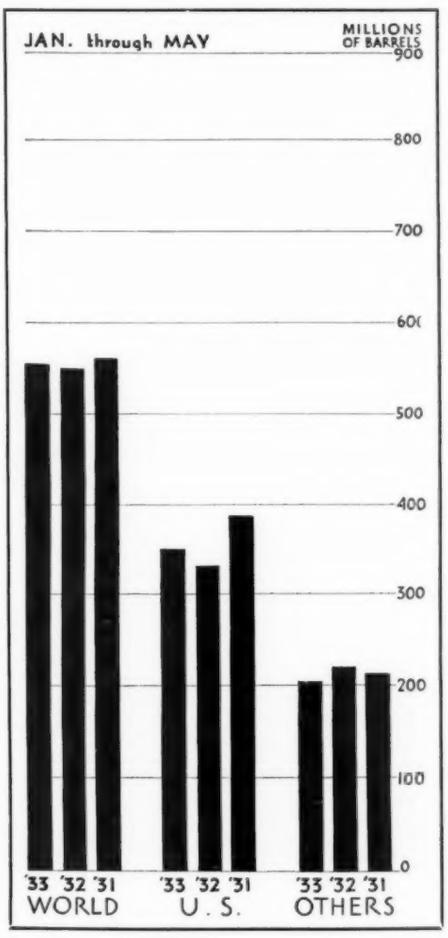
All figures furnished direct to WORLD PETROLEUM by Governments, except where otherwise specified

(Figures in U. S. Barrels—Conversion ratio 7 bbl.=1 ton)

Country	January 1933	February 1933	March 1933	April 1933	May 1933	June 1933
United States	63,998,000	61,029,000	75,302,000	63,313,000	84,747,000	78,483,000[4]
Russia	10,382,400	10,162,600	11,003,300	11,824,400	12,794,600	12,489,400
Venezuela	8,750,000	9,985,711	10,324,328	9,340,870	9,380,893	9,380,000[1]
Roumania	3,999,898	3,661,749	4,009,649	3,949,001	4,104,919	3,500,000[1]
Persia[2]	3,563,112	2,929,668	3,683,386	3,984,519	4,370,835	4,300,000[1]
Mexico	2,889,658	2,543,443	2,825,021	3,011,973	2,857,620	2,805,346
Netherland India	3,096,051	3,031,021	3,390,051	3,028,639	3,337,214	3,280,382
Colombia	1,005,353	1,035,273	1,218,626	1,093,410	1,169,238	1,113,328
Argentina	1,138,500	1,153,500	1,140,000	1,051,000	1,210,300	1,181,500
Peru	976,931	806,785	825,000	818,359	820,000[1]	907,863
Trinidad	815,439	778,842	839,857	834,876	816,080	772,626
British India	732,894	669,617	124,103	700,000[1]	700,000[1]	700,000[1]
Poland	338,100	299,845	300,000[1]	318,619	326,900	325,000[1]
Sarawak	180,320	194,166	214,984	196,595	203,385	189,000[1]
Japan and Taiwan[1]	195,000	195,000	195,000	195,000	195,000	195,000
Egypt	136,451	126,861	131,964	124,103	138,348	137,620
Ecuador	133,912	119,345	128,504	121,647	128,226	141,640
Canada	82,778	73,087	87,218	84,974	89,754	113,447[1]
Germany	130,732[3]	121,835[3]	141,183[3]	129,591[3]	134,666[1]	130,200[1]
Iraq[1]	100,000	100,000	100,000	100,000	100,000	100,000
France[1]	46,000	46,000	46,000	46,000	46,000	46,000
Others[1]	36,000	36,000	36,000	36,000	36,000	36,000
Total	102,727,529	99,099,348	116,066,174	104,302,576	127,726,978	120,327,352

[1] Estimate. [2] Anglo-Persian Oil Co. figures revised; fuel oil returned to the ground has been deducted. [3] Thuringea estimated 7,000 bbl.: official figure for Prussia. Sakhalin Russian included with Russia. Sakhalin Japanese included with Japan. [4] A.P.I. estimate.

Comparison of crude oil production in the United States, all other countries and total for the world during the first five months of 1933 and corresponding periods of 1932 and 1931.



Official Figures for 1931, 1932 and First Six Months of 1933

Country	Total 1931	Daily Average 1931	Total 1932	Daily Average 1932	Total 6 months 1933	Daily Average 6 months 1933
United States	851,081,000	2,331,729	781,845,000	2,136,188	426,872,000	2,358,409
Russia	156,342,900	428,336	149,719,000	409,070	68,656,700	379,319
Venezuela	120,343,104	329,707	119,596,512	326,766	57,161,802	315,811
Roumania	46,333,945	126,942	50,491,205	137,954	23,225,216	128,316
Persia[2]	40,253,486	110,283	45,122,455	123,285	22,831,520	126,141
Mexico	33,038,853	90,517	32,802,285	89,624	16,933,061	93,553
Netherland India	32,818,346	89,913	39,584,027	108,153	19,183,358	105,985
Colombia	18,237,190	49,965	16,384,956	44,768	6,635,228	36,659
Argentina	11,709,759	32,081	13,166,900	35,975	6,874,800	37,982
Peru	10,102,116	27,677	9,899,266	26,026	5,154,938	28,480
Trinidad	9,743,763	26,695	10,023,780	27,387	4,857,720	26,838
British India	7,830,101	21,452	8,600,312	23,500	3,626,614	20,036
Poland	4,397,760	12,048	3,905,230	10,670	1,908,464	10,544
Sarawak	3,338,472	9,146	2,274,043	6,213	1,178,450	6,511
Japan and Taiwan[1]	1,884,285	5,135	2,340,000	6,393	1,170,000	6,464
Egypt	1,845,938	5,057	1,742,370	4,760	795,347	4,394
Ecuador	1,750,633	4,796	1,573,857	4,300	773,274	4,272
Canada	1,583,339	4,337	1,054,373	2,880	507,811	2,806
Germany	1,778,602	4,873	1,824,019	4,983	788,207	4,355
Iraq[1]	1,200,000	3,300	1,200,000	3,300	600,000	3,315
France[1]	512,862	1,405	552,000	1,508	276,000	1,525
Others[1]	338,700	930	432,000	1,180	216,000	1,193
Total	1,256,465,154	3,442,370	1,294,134,090	3,535,885	670,226,510	3,702,908

Science of Automatic Control in Refining

The Third of a Series of Articles in Which C. E. Mason, Chief Research Engineer, The Foxboro Company, Analyzes a Temperature Control Problem, Constructing the Resulting Equations.

IN THIS, the third of a series of articles dealing with the fundamentals of automatic control as applied to petroleum refining, Mr. Mason gives a detailed analysis of a temperature control problem deriving therefrom formulae indicating results of various reactions. As part of a text on the fundamentals of control engineering these equations, published for the first time, are of the utmost importance. In the preceding installment of this series the author analyzed certain fundamental lags and described the methods by which they were overcome; in this installment he treats a simple temperature control problem from the standpoint of obtaining perfect balance by manual control. The problem considered here illustrates a predominance of capacity lag and includes practical methods of obtaining the desired control.

USUALLY in considering throttling automatic control of temperature we allow ourselves to be content with a brief analysis which tends to conclude that an automatic control instrument causes the flow of the controlled medium to increase or decrease a small amount or a larger amount in rough proportion to the apparent demand without considering any definite values of these changes or rates of change.

In case of hand control and where there is a record being made of the effects of manual adjustments, we unconsciously analyze the effects and rates of change produced, and by experience we learn to adjust the magnitudes of the manual changes in valve opening to give certain relative changes in flow.

We quickly observe, under manual control of a continuous process, that if we make excessive changes, it is soon necessary to counteract these changes with opposite changes and that a smooth, steady flow, which will be reasonably correct for long periods of time, can only be obtained by minute careful adjustments until a smooth temperature record indicates that the adjusted flow is very nearly equal to the actual average demand. The closer the balanced temperature comes to the desired control point, the smaller and more carefully these adjustments must be made.

If a change in demand occurs, the previously adjusted flow will cause the process to balance out at some point other than the desired control point and the same human judgment is necessary to establish a correct balance in the least possible time.

A manual operator without previous experience would have no idea as to what magnitude of adjustment to make in order to establish the desired balance in the least possible time. He would, however, have the instinct mentioned above, that is, to make a *small* change in the right direction for a *small* deviation but if he never learned to give some finite values to these changes and proportion them according to their effects, he would never develop into a desirable manual operator.

A good manual operator would attempt to make an exceptionally small change and wait until the process had balanced out or wait until the record indicated some probable balance and then make what he hopes will be a more nearly correct adjustment by remembering the magnitude of the previous adjustment and observing its effect. Continuous manual control is a continuation of this procedure of attempting to balance supplies and demands.

Merely for the sake of clearness let us consider a specific problem in which we can make it possible to measure supplies and demands as well as to record the effects of their changes and thus accurately analyze what flow reactions are necessary to obtain perfect process balance by manual control.

Referring to Fig. V we have indicated a simple control problem in which it is necessary to adjust a flow of hot water to mix with a variable amount of cold water to obtain a mixture of water in the vessel at a constant temperature.

In temperature control we are in reality controlling the flow of B.T.U.'s and thus the insufficient amount of B.T.U.'s, below the desired control temperature, contained in the cold water, may be considered as determining the *demand* for B.T.U.'s and the number of excess B.T.U.'s in the hot water may be considered as determining the *supply* of B.T.U.'s. It will be necessary to keep the supply equal to the demand if a constant temperature is to be maintained.

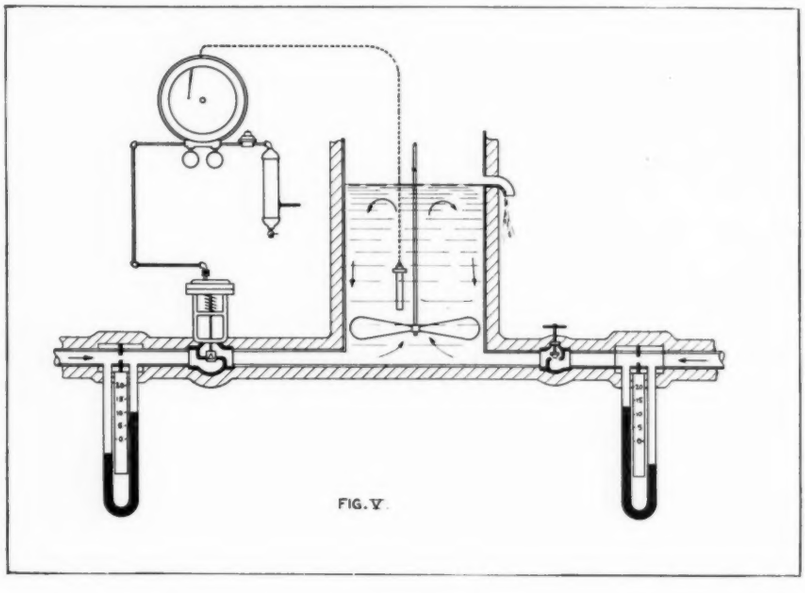


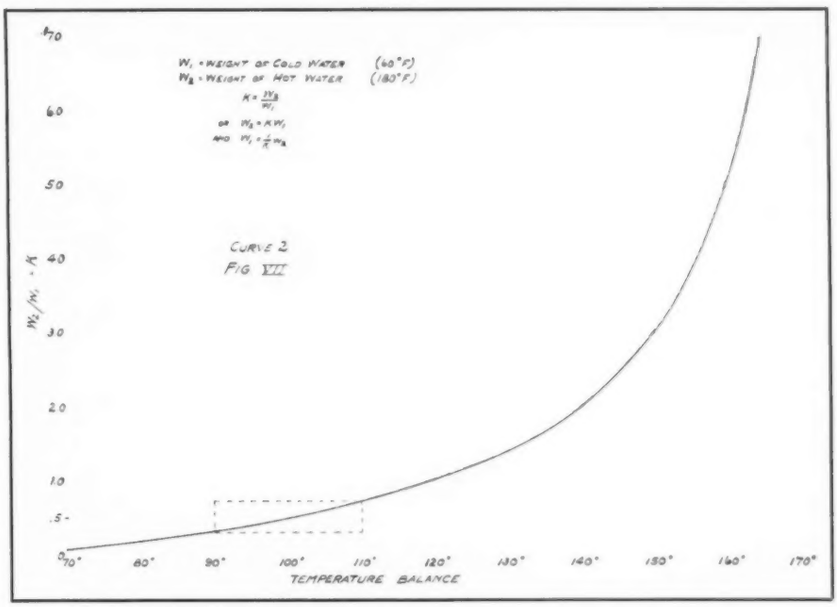
FIG. V

We have shown the equipment with lines and vessel insulated and it is necessary to have them very well insulated in order to avoid any radiation which would make our actual demand some value greater or less than that represented by the amount of cold water.

The amount of B.T.U.'s contained in both hot and cold water depends on the temperature as well as the quantity and in order to avoid complicating our calculations of B.T.U. content by having the temperature variable,—which would affect our flow measurements as well as B.T.U. contents,—it will be necessary to use hot and cold water of constant temperatures. Thus the quantities of hot and cold water will have a definite proportion to the supplies.

We have shown orifice plates installed in the hot and cold water lines and Indicating Differential Gauges for measuring the actual flows of hot and cold water. We have shown direct-reading scales on the Differential Gauges, reading in pounds of water per minute, and have proportioned the orifice sizes to correct for temperatures of the hot and cold water.

Although we intend manually operating the valve in the hot water line, we have shown an air-operated controlled valve and its position of opening may be adjusted by placing the instrument on remote hand control and adjusting the air supply pressure by means of the reducing valve (A) thus using the instrument only as a recorder of the temperature in the vessel. The object of using a controlled valve is to provide desirable flow characteristics and thus simplify the flow adjustments. The nature of the characteristics will be explained later.



In order to avoid stratification of hot and cold water, which would cause false indications of the average vessel temperature, we have shown a rotary propeller which functions to keep the water in the vessel thoroughly mixed.

In order to permit simple heat balance calculations, let us assume that:

W_1 = weight of cold water flowing through (B).
T_1 = temperature of cold water flowing through (B).
W_2 = weight of hot water flowing through (C).
T_2 = temperature of hot water flowing through (C).
T_b = final balanced temperature in vessel.

From the above it is evident that the temperature balance is represented by the following equation of heat balance:

$$T_b = \frac{(W_1 \times T_1) + (W_2 \times T_2)}{W_1 + W_2} \quad (1)$$

Since, as explained above, it will be desirable to maintain T_1 and T_2 constant, it is possible to express T_2 in terms of T_1.

If we let $R = \frac{T_2}{T_1}$ then $T_2 = RT_1$ and (1) becomes

$$T_b = T_1 \frac{(W_1 + W_2 R)}{W_1 + W_2} \quad (2)$$

In order to determine the amount of hot water necessary to give a certain temperature balance when the amount of cold water is known, we may transpose equation (2) as follows:

$$T_b = T_1 \frac{(W_1 + W_2 R)}{W_1 + W_2} \quad (2)$$

$$T_b W_1 + T_b W_2 = T_1 W_1 + T_1 W_2 R$$
$$T_b W_2 - T_1 W_2 R = T_1 W_1 - T_b W_1$$
$$W_2(T_b - T_1 R) = W_1(T_1 - T_b)$$

$$W_2 = W_1 \frac{(T_1 - T_b)}{T_b - T_1 R} \quad (3)$$

$$\text{also } W_1 = W_2 \frac{(T_b - T_1 R)}{T_1 - T_b} \quad (4)$$

Since it will simplify our problem to have constant temperatures of hot and cold water, we will assume that:

$T_1 = 60$ deg. F.
and $T_2 = 180$ deg. F.
then $R = 3$
and $T_2 = 3T_1$

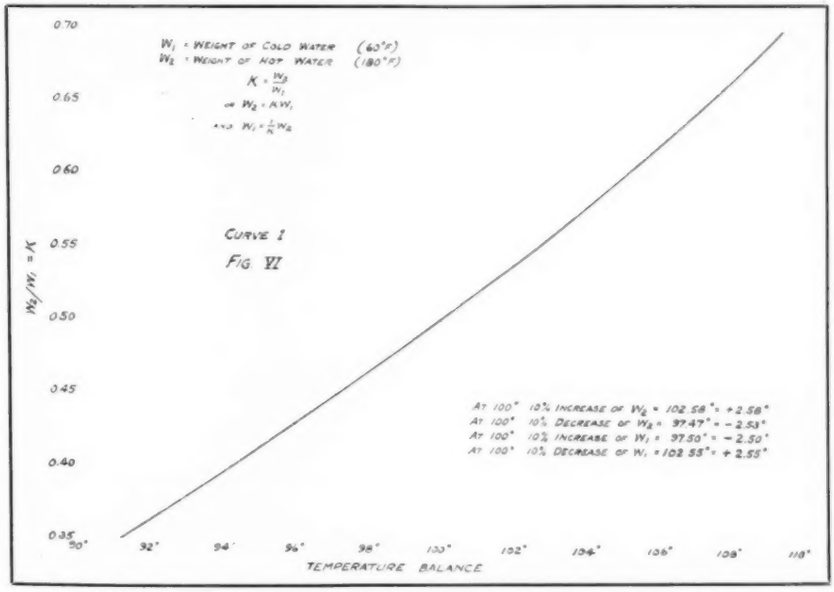
Under these assumptions equation (2) becomes:

$$T_b = 60 \frac{(W_1 + 3W_2)}{W_1 + W_2} \quad (5)$$

and equations (3) and (4) become:

$$W_2 = W_1 \frac{(60 - T_b)}{T_b - 180} \quad (6) \quad \text{and} \quad W_1 = W_2 \frac{(T_b - 180)}{60 - T_b} \quad (7)$$

If we assume that our desired temperature balance or control point is 100 deg. F. and substitute in (6) or (7) we find that:



$$W_2 = W_1 \frac{(60-100)}{100-180}$$

$$W_2 = W_1 \frac{(-40)}{(-80)}$$

$$\text{thus} \quad W_2 = .5W_1 \tag{8}$$

$$\text{or} \quad W_1 = 2W_2 \tag{9}$$

For every other temperature balance there will be some definite relation between W_1 and W_2.

Thus we are able to write:

$$W_2 = KW_1 \tag{10}$$

$$\text{and} \quad W_1 = \frac{W_2}{K} \tag{11}$$

$$\text{or} \quad K = \frac{W_2}{W_1}$$

in which K is some factor depending on the temperature balance.

In order to avoid numerous calculations we have plotted curve (1) Fig. VI which represents these relations. The abscissae represent temperature balances and the ordinates represent K in equation (10) or (11).

For deviations of 10 deg. on either side the assumed control point of 100 deg. F. we see that the curve is practically a straight line, which means that within the temperature range through which the curve may be considered a straight line — deviations are proportional to percentage changes of W_1 or W_2. The calculations at the bottom of the curve show the exact deviation produced by 10 percent increases and decreases of W_1 and W_2.

Curve No. 2, Fig. VII represents a continuation of curve No. 1 and for sake of comparison the proportions of curve No. 1 are shown in the dotted section of curve No. 2.

From curve No. 2 we see that the curve continues practically straight for considerable temperature variation beyond the scale of curve No. 1 and that the value of K approaches zero as the balance temperature approaches 60 deg. F. and that the value of K approaches infinity as the balance temperature approaches 180 deg. F. Thus curve No. 2 is a perfect hyperbola.

These limiting values simply substantiate the fact that if we had even the minutest flow of cold water, it would require an infinite amount of hot water (180 deg. F.) to give a balanced temperature of 180 deg. F. or that if we had even a very large flow of cold water at 60 deg. F. the minutest amount of hot water would give a balanced temperature above 60 deg. F.

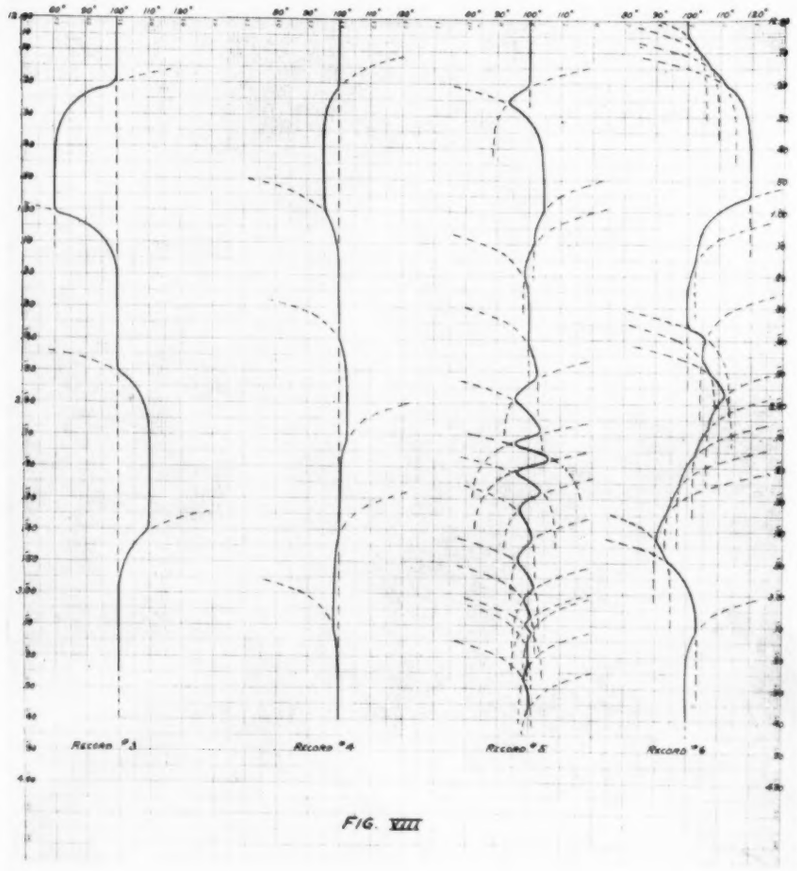


FIG. VIII

If we assume a flow of 10 lbs. per minute is passing through valve (B) and 5 lbs. per minute is passing through the controlled valve (C) and that the temperature in the vessel is 100 deg. F., that temperature will remain as long as the amount of hot water remains 0.5 of the amount of cold water, regardless of the quantities. However, if the amount of cold water is changed but we allow the amount of hot water to remain the same, a new ratio (K valve) is established and a new temperature balance will eventually be established, but not until all of the water in the vessel above the new temperature balance has been replaced by water at the new temperature balance.

With the stirrer functioning so as to maintain all of the water in the vessel at the same temperature, the rate of temperature change will be a maximum at first and gradually approach zero rate of change (or constant temperature) as the new temperature balance is reached.

The *maximum* or *initial* rate of temperature change will depend on three factors:—

1. **The total amount of hot and cold water flowing**
2. **The magnitude of cold water change**
3. **The capacity of the vessel**

Since the capacity of the vessel has not changed in the case above and we have allowed the amount of hot water to remain unchanged, the maximum rate of temperature change depends entirely on the magnitude of cold water change.

In order that the small transfer lag of the Recording Thermometer may be negligible we have used a comparatively large vessel (approximately 22 gallons) and to obtain accurate time intervals we have used a clock that produced one revolution of the chart in 24 minutes.

Since the record of the Recording Thermometer is temperature plotted against time we may replot the temperature record on rectangular coordinates to obtain a curve of the rate of temperature change.

Record No. 3, Fig. VIII is a replot of a temperature record produced by having first established a temperature balance of 100 deg. F. by maintaining the flow of cold water equal to 10 lbs. per minute and a flow of hot water equal to 5 lbs. per minute and suddenly changing the amount of cold water to 25 lbs. per minute.

From these values we see that K in equation (10) becomes 0.2 ($K = 5/25$) and from curve No. 2 or equation (5) that the new temperature balance is 80 deg. F.

An examination of record No. 3 shows that a balanced temperature of 80 deg. was practically reached at the end of 25

minutes and that the first 10 deg. change, or a temperature of 90 deg., was reached at the end of approximately 4 minutes.

This represents a maximum rate of temperature change of a little better than 3 deg. per minute for the first minute and the record shows that the rate of change for the 25th minute was practically zero.

The derivation of the equation for the curve produced by this obvious relationship involves calculus. However, for those interested in the mathematics of this relationship, its derivation will be given in the Appendix at the end of the series.

If it was desirable to return the balance temperature to 100 deg. it would be necessary to reëstablish the original relation between W_2 and W_1. If the flow of cold water was to remain 25 lbs. per minute it would be necessary to increase the amount of hot water to $(W_2 = .5 \times 25)$ or 12.5 lbs. per minute. On record No. 3 this was done at 1 o'clock, and we see that the temperature returns to 100 deg. on a curve apparently identical with the original temperature change curve except that it extends in the opposite direction.

At 1 hour and 50 minutes the flow of cold water was decreased to 17.5 lbs. per minute. This established a K value of $\frac{12.5}{17.5} = 0.714$ and from curve (2) or equation (5) we can calculate a temperature balance of 110 deg. Record No. 3 checks this calculation of 110 deg. as a temperature balance.

At 2:40 o'clock the original K value of 0.5 was reëstablished by reducing the flow of hot water to 8.75 lbs. per minute $\frac{8.75}{17.5} = .5$ so that the new temperature balance would again be 100 deg. Record No. 3 shows that this balance was practically obtained after about 20 minutes.

A comparison of all four of these temperature balancing curves indicates that they are sections of the same curve and their continuations by dotted lines show the close similarity.

Record No. 4 represents smaller changes in demand, and their corresponding corrections, in supply of hot water, and the continuations of these curves by dotted lines indicate that they are again smaller sections of the same curve.

These curves are mathematically identical if the quantity of hot and cold water remains the same, i.e. if the ratios of hot to cold were changed by increasing one and decreasing the other. However, variations of 2 to 1 in this quantity of water, produce a small influence since it enters as a function of the ratio of this quantity to the capacity of the vessel.

The equation for these curves is given here in the form most convenient for interesting substitutions:—

$$T_t = T_b - \left[\frac{(T_b - T_o)}{10} \times \text{Antilog}\left(1 - .4343\,\frac{Q}{C}\right)\right]$$

T_b = Original balanced temperature.
T_o = Final balanced temperature. (Equation 5)
T_t = Actual temperature at any time period after the change.
Q = Total pounds of water flowing (hot and cold) since the change.
C = Capacity of vessel in pounds of water.

From this equation it is obvious that in order for T_t to become exactly equal to T_b it is necessary for the quantity in the brackets to be equal to zero. Thus one of the factors must be equal to zero. If T_b is equal to T_o the quantity $(T_b - T_o)$ becomes zero and Q and C may be any value. However, if $(T_b - T_o)$ is any value other than zero, Q must be infinite or C equal to zero for the antilog to become exactly equal to zero, because the Antilog of minus infinity is zero, i e. the logarithm of zero is minus infinity. Theoretically T_t will never become exactly equal to T_b but the difference becomes negligible in a reasonable time.

Another interesting relation shown by this equation is the fact that 20 deg. deviation comes to within 2 deg. of balance in the same time as 10 deg. comes to within 1 deg. of balance or as 1 deg. comes within 0.1 deg. of balance.

From records No. 3 and No. 4, Fig. VIII it is obvious that, if we should disregard the cold water meter we could, by experience, learn to estimate the probable point of balance or the probable readjustment of the flow of hot water necessary to re-establish a temperature balance of 100 deg. by observing the rate of temperature change produced by certain adjustments.

Record No. 5, Fig. VIII is the result of such an estimate. A temperature balance of 100 deg. F. had previously been made and at 12:20 an unknown change was made in the flow of cold water. Five minutes after the change we might estimate that the change of cold water had been about the same as that made in the first change of Record No. 3 at (12:20 o'clock) and thus make roughly the same increase in hot water flow as was made at 1:00 o'clock on record No. 3. However, after making the change and waiting for a temperature balance to be established we see that the change in hot water flow was excessive and that the new balance was approximately 104.5 deg. F.

If at 1 o'clock on record No. 5 we make a reduction of hot water flow of about the same magnitude as at 2:10 o'clock on Record No. 4 and wait for 10 minutes we see that our correction was not sufficient and that it will be necessary to make another smaller correction. After another ten minutes' duration, it is evident that the last correction was excessive and that it is necessary to make another opposite correction to obtain a balance of 100 deg.

In actual practice the changes in demand will not necessarily be sudden, but will probably be slow gradual changes. The changes of manual adjustment will be sudden in comparison and better manual control will be obtained if small changes are made with the idea of gradually bringing the balance back to the control point.

The continuation of Record No. 5 beyond 1:40 o'clock represents the effect of always making excessive adjustments. The magnitude of the excesses have been varied to show the effect. The continuations of the dotted lines would represent the probable balance points and give a general idea of the magnitudes of the overcontrolling.

A continually changing demand produces a temperature deviation curve that is rather difficult to divide into its components so as to satisfy the fact, as substantiated so far, that all temperature balance curves are certain sections of one general curve.

This fact is invariably overlooked when considering control results by analyzing control records, and when unfavorable lags are involved the simplicity is less obvious. The temperature curve beginning at 12:00 o'clock on Record No. 6 shows the effect of continuous change in demand. A temperature balance of 100 deg. was established by a hot water flow of 5 lbs. per minute and a cold water flow of 10 lbs. per minute. The flow of cold water was first reduced at 12:05 o'clock to 8.3 lbs. per minute which, if allowed to continue, would give a temperature balance of 105 deg. F. At the ends of the next three 5-minute periods the flows were changed respectively to 7 lbs., 5.9 lbs, and 5 lbs. per minute, giving corresponding balanced temperatures of 110 deg., 115 deg., and 120 deg. The effect is shown to be practically a straight line.

At 12:55 o'clock the cold water flow was increased to 9.8 lbs. and at 1:15 o'clock flow of cold water was increased to 10 lbs. per minute with a final K value of 0.5 and a final balance temperature of 100 deg.

The last section of Record No. 6 illustrates some irregular changes in cold water flow (or demands) which produce temperature records such that it would be impossible to separate them into component parts of one general curve without knowing how they were produced. The dotted extensions of the sections show the way they were produced.

Part IV of this series will be a continuation of analyses of manual control to show what physical reactions are necessary to compensate for these temperature balancing characteristics.

UNITED STATES

	Daily Production bbl.	Daily Runs to Stills bbl.	Gasoline Stocks bbl.	Imports for week bbl.	California Shipm. East for week bbl.
Week Ending June 24	2,704,855	2,510,000	55,190,000	521,000	69,000
	756,255*				
Week Ending July 1	2,781,190	2,490,000	54,390,000	768,000	81,000
	701,340*				
Week Ending July 8	2,780,750	2,495,000	54,170,000	1,115,000	748,000
	732,550*				
Week Ending July 15	2,790,220	2,525,000	53,800,000	1,064,000	182,000
	704,870*				
Week Ending July 22	2,723,530	2,535,000	53,940,000	1,168,000	44,000
	598,980*				

Underlined figures indicate improvement in statistical position—decrease in production runs to stills, gasoline stocks or imports.

* Total estimated production, official and unreported, of the Rusk-Gregg field, East Texas.

Exports—Imports

DURING May, 1933, the eleventh month after imposition of a tariff on crude oil and its products, total imports declined radically to 2,859,000 bbl. (the smallest volume since August of 1932), as compared with 4,264,000 bbl. imported in the preceding month, a drop of 32.9 percent; during the first six duty-free months of 1932 total imports averaged 9,090,000 bbl. per month. A nominal volume of 1,000 bbl. of motor fuel was imported during the whole of May, 1933, as compared with a monthly average of 1,272,000 bbl. imported during the first six duty-free months of 1932.

Exports of all petroleum products, and of motor fuel as well, declined during May, 1933, to the average post-tariff level after an unusually heavy volume exported in April, 1933. Total exports in May, 1933, amounted to 8,177,000 bbl. as compared with 9,671,000 bbl. exported during the preceding month, a decline of 14.95 percent, and 30.80 percent under the total exports in May of 1932. Motor fuel exports declined to 2,129,000 bbl. in May, 1933, as compared with 3,256,000 bbl. exported in April, a decline of 34.56 percent, and 53.80 percent under motor fuel exports in May of 1932.

The post-tariff trade readjustment, favorable to domestic producers, continued into May of 1933. Reduction in motor fuel imports of 1,271,000 bbl. was counterbalanced by the reduction in motor fuel exports which declined 1,411,000 bbl., while the imports of all other petroleum products contracted by 4,960,000 bbl. during May, 1933, and their exports declined by but 14,000 bbl., leaving a favorable post-tariff balance of 4,726,000 bbl., or 152,300 bbl. per day, which was taken out of domestic products and not from the imports, which would have been the case if the oil tariff had not been in force. The above figures are arrived at by comparing the monthly average for the first six duty-free months of 1932 with the export-import data for the latest month on record.

Motor Fuel Demand Above 1932

INDICATED domestic demand for motor fuel during May, 1933, averaged 1,097,000 bbl. per day, an increase of 8.30 percent over the daily average for the preceding month; 51,200 bbl. above the domestic motor fuel consumption in May of 1932, an increase of 4.9 percent; but 90,500 bbl. per day under the domestic motor fuel consumption in May of 1931, the peak year, a decline of 7.52 percent. In part the increase in domestic demand was due to shipments to consuming centers from refineries prior to imposition of additional Federal excise tax and therefore somewhat in excess of actual consumption. The domestic motor fuel consumption during May, 1933, thus recorded the first favorable major trend reversal, the demand for the first time markedly exceeding the figures for the corresponding period of 1932. The sustained improvement of the industrial activity in the United States as indicated by the New York Times weekly index of business, which reached the best level since June of 1930, promises continued acceleration of domestic motor fuel consumption. The major setback in commodity and stock exchange prices in the United States at the close of July, 1933, should be considered as primarily of a speculatively corrective nature, and as such should not affect the sound improvement in the fundamental conditions of the country, sponsored and closely watched over by the federal administration.

The daily rate of exports of motor fuel averaged 69,000 bbl. in May, 1933, a decrease of 36.7 percent under the preceding month; a decrease of 53.6 percent under May of 1932; and of 56.1 percent under May of 1931.

Total daily demand for motor fuel in May, 1933, therefore decreased by 2.59 percent as compared with the same month of 1932; and by 13.3 percent as compared with May of 1931, the year in which the motor fuel demand was at peak.

On June 1, 1933, motor fuel stocks at refineries, terminals and in transit amounted to 59,133,000 bbl., a decrease of 561,000 bbl. as compared with stocks on hand on April 1, 1933, indicating that during May motor fuel demand exceeded supply by 18,100 bbl. per day. On June 1, 1932, total motor fuel stocks amounted to 69,135,000 bbl. indicating that in the past year comparable storage has been reduced by 10,002,000 bbl., economically and statistically a most favorable factor, but currently entirely overshadowed by excessive rate of domestic crude oil production which resulted in a net gain in total stocks of all oils of 9,555,000 bbl. during May of 1933, indicating a daily gross addition to stocks of 308,000 bbl.

The crude oil and natural gasoline production during May, 1933, averaged 2,827,000 bbl. per day, the highest daily output recorded since October of 1929. The high rate of production was extended into June, 1933, when it averaged about 2,840,000 bbl. per day. Several factors have been responsible for the crude oil production running about 500,000 bbl. in excess of requirements in the last two months.

1. Cheap crude oil prices were caused by local overproduction in the East Texas field, but resulting declines in posted quotations elsewhere made purchasing and storing of crude oil very profitable, thus greatly increasing the demand throughout the Mid-Continent oil fields.
2. Local refusals of producers to sell crude oil at low prices forced a number of refiners to shut down, or to run low on their stocks, thus impressing upon them the instability and the uncertainty of the crude oil supply and hence their desire to stock up at low prices and while such supply was available in more distant fields.
3. The improbability of low crude oil prices and unrestricted production extending for any length of time, or its recurrence in the future, due to the forthcoming federal intervention, further accelerated the demand by companies desiring to profit from currently unstable conditions. The anticipated federal measures include the Code of Fair Competition and, effective July 12, 1933, the prohibition of transportation in interstate and foreign commerce of crude oil illegally produced.

The Statistical Subcommittee of the American Petroleum Institute issued its forecast of the economic position of the oil industry for the six months ending December 31, 1933. The subcommittee estimates the daily average requirements for domestic crude oil for the last six months of 1933 at 2,362,000 bbl., of which 2,262,000 bbl. are recommended to be derived from production and 100,000 from storage; the required daily average crude oil runs to stills are estimated at 2,308,000 bbl. Total demand for motor fuel is estimated to increase 2.9 percent over the comparable period of 1932, with domestic consumption increasing 3.0 percent.

The actual current crude oil production and runs to stills are therefore respectively 528,000 bbl. and 217,000 bbl. per day in excess of economic requirements.

Prices Irregularly Higher

CRUDE OIL and motor fuel prices moved irregularly higher during July influenced favorably by reduced allowable production in

Crude Oil Prices

(Dollars per Barrel)

		Jan. 17 1933	May 2–9 1933	June 17 1933	July 6–17 1933		
Okla., N. Texas and Kansas	28 deg.	$0.28		$0.28	$0.61[3]	$0.38[4]	$0.51[5]
	36 deg.	44	$0.25 flat	44	77	54	67
	40 deg. top	52		52	85	62	75
East Texas	flat	50	25[1]	50	75		
West Texas	flat	30	20	30			45
Gray Co., Texas	40 deg.	40	20 flat	40	73		69
Gulf Coast incl. Conroe	25 deg.	44		44			
	30 deg.	54	30 flat	54			
	34 deg. top	62		64			
Smackover, Ark.	flat	40	20	30			
Rocky Mountains:							
Salt Creek	36 deg.	44	25	54			
Elk Basin	flat	62	62	62			72
Pennsylvania:							
Bradford Distr.	flat	1.47	1.27[2]	1.47	1.70		1.85[6]
Eureka Lines	flat	1.12	92	1.12	1.32		1.47[6]
Mt. Pleasant, Mich.	flat	95	75	75			90

	June 26 1932	March 5 1933	June 26 1933
California:			
Santa Fe 34 deg.	$1.18	$0.87	$1.02
Kettleman Hills 39 deg. top	1.03	78	88

[1] 10¢ April 24 to May 4.
[2] Intermediate 10¢ advances made in May, June and July in Pennsylvania crudes not shown.
[3] Posted on July 6 by Continental, Consolidated, Empire, Pure, Barnsdall, Phillips and Derby companies, but reduced to Magnolia schedule[5] on July 11.
[4] Posted by Carter (S.O.N.J.), Stanolind (S.O.Ind.), The Texas and Gulf companies.
[5] Posted by Magnolia (Soc.-Vac.)
[6] Raised on July 28 to $2.00 per bbl. in Bradford and $1.62 in Eureka pipelines.

the East Texas field, by federal intervention in prohibiting the shipments of illegally produced crude oil and its products and by the forthcoming adoption of the Code of Fair Competition. The irregularity and weakness of the advance was due to the continuation of illegal production in the East Texas field till July 20 and to the rush of refiners and crude oil purchasers to store up before the Code is promulgated.

Since July the tank wagon/service station prices have been stabilized throughout the United States consolidating the gains made in June. Of the major readjustments particular note should be taken of the advance on July 2 of tank wagon/service station prices one cent per gallon in Oklahoma, the retail quotations reaching 15–17–19½ cents per gallon respectively for the three grades, including all taxes. On July 10 the Standard Oil Company of Indiana advanced tank wagon/service station prices on all grades ½ cent per gallon, thus meeting advances made by other companies on July 1, the new retail prices becoming 14.1–15.6 –18.1 cents per gallon; and on July 12 the Standard Oil Company of Ohio posted ½ a cent advance on all grades throughout its territory bringing the retail prices to 16¾–18½ –21 cents per gallon (excluding 2 cent cash discount).

Refinery gasoline quotations during July remained unchanged to slightly higher from the preceding month: 3¾–4 cents per gallon for 58–60 U.S.M., 57 and below octane rating in Group 3, Oklahoma market; 57 to 64 octane rating, U.S.M., was quoted at 4⅝–4¾ cents per gallon; and 65 and above octane rating, U.S.M., commanded 4⅞–5⅛ cents per gallon. On the East Coast, at Bayonne, the U.S.M. grade, 57 to 64 octane rating, was quoted at 5¾–5 9/10 cents per gallon, ½ a cent above June prices. Gulf Coast prices for export on July 18 were 4½ cents per gallon for 58–60 U.S.M. grade, unchanged from the preceding month.

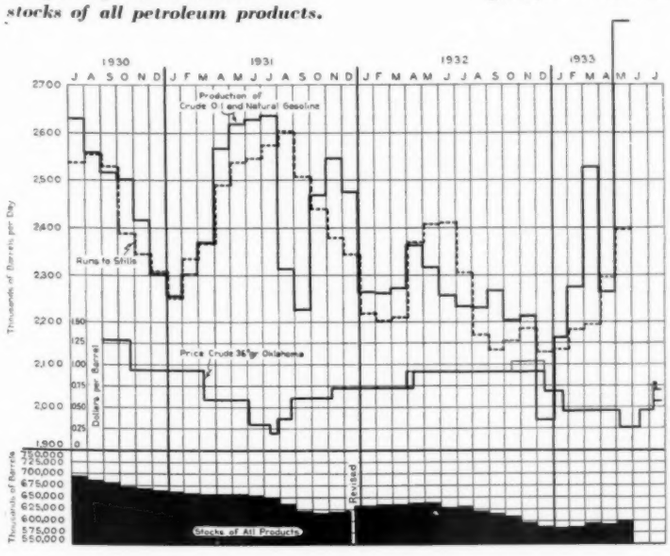
Natural gasoline moved up slightly during July and was quoted at 3 cents per gallon for grade 26–70 in Oklahoma and North Texas, and at 3¼–3½ cents per gallon in Northern Louisiana.

Kerosene prices gained about ½ a cent per gallon during July. On July 22 grade 41–43 w.w. was quoted at 2⅞–3½ cents per gallon in Group 3, Oklahoma market, and at 5–5¼ cents per gallon on the East Coast, at Bayonne. Gulf Coast prices for export firmed to 4–4¼ cents per gallon for 41–43 p.w. grade.

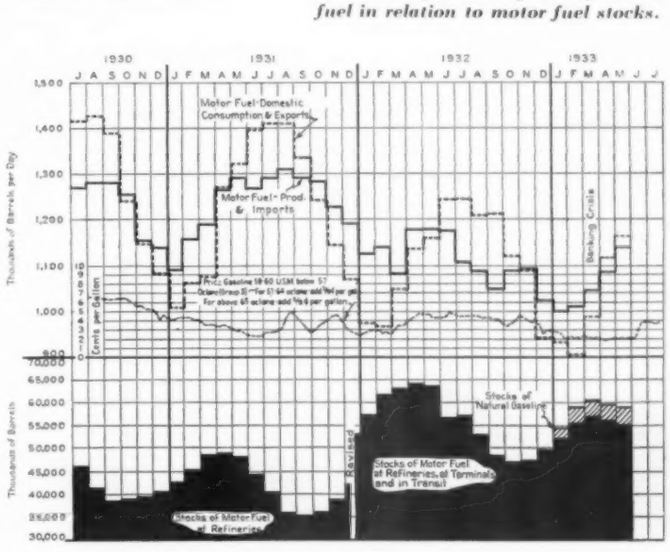
Posted crude oil prices throughout the United States were again advanced at the close of June and in the beginning of July, but the advances were not uniform and different prices were quoted by various crude oil purchasing companies. On the Pacific Coast the Standard Oil Company of California on June 26 raised crude oil prices from 2 to 15 cents a barrel, the advance being immediately followed by Shell Oil Company, Associated Oil Company and others.

On July 6 the Continental Oil Company advanced Mid-Continent crude oil prices 33 cents a barrel, the 36 gravity crude in Oklahoma, North Texas and Kansas being raised from 44 cents to 77 cents per barrel. The Continental Oil Company's action was followed by Consolidated Oil Corporation, The Empire Companies, Pure Oil Company, Barnsdall Corporation, Phillips Petroleum Company, Derby Oil Company and a few others. A few hours after the Continental Oil Company's 33-cent-a-barrel advance the Carter Oil Company (S.O.N.J.) announced only a 10-cent-a-barrel advance, which was met by Stanolind Crude Oil Purchasing Company (S.O.Ind.) and The Texas Company. The Magnolia Petroleum Company (Soc.-Vac.) split the difference between the two schedules by posting a 23-cent-a-barrel advance paying for the 36 gravity Oklahoma crude oil 67 cents per barrel, and on July 11 the Continental and others reduced their price 10 cents a barrel meeting the Magnolia price. Several divergent schedules were posted in

U. S. production, runs to stills and price of crude oil in relation to stocks of all petroleum products.

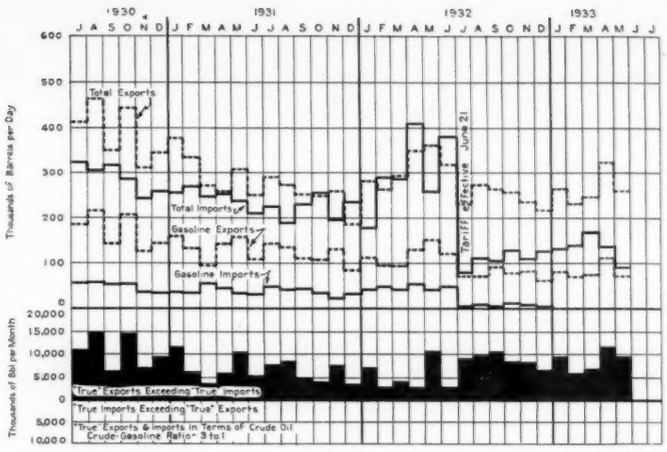

1930
1931
1932
1933
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J
Production of Crude Oil and Natural Gasoline
Runs to Stills
Price Crude 36° Oklahoma
Dollars per Barrel
Thousands of Barrels per Day
Stocks of All Products
Revised

U. S. consumption and exports, production, imports and prices of motor fuel in relation to motor fuel stocks.


1930
1931
1932
1933
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J
Motor Fuel-Domestic Consumption & Exports
Motor Fuel-Prod. & Imports
Banking Crisis
Cents per Gallon
Thousands of Barrels per Day
Stocks of Natural Gasoline
Stocks of Motor Fuel at Refineries, at Terminals and in Transit
Stocks of Motor Fuel at Refineries
Revised

most of the Mid-Continent oil fields, the differences probably to remain until the stabilization of the industry through the Code of Fair Competition.

With the promulgation of the Code of Fair Competition in the near future and the already proven effectiveness of the prohibition of the shipments of illegally produced crude in interstate and foreign commerce, crude oil prices may be expected to be stabilized during August, 1933, at about $1.00 per barrel, with the refinery gasoline quotation correspondingly advancing to 5 cents per gallon for 58–60 U.S.M. grade 57 to 64 octane rating.


1930
1931
1932
1933
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J
Total Exports
Total Imports
Gasoline Exports
Gasoline Imports
Tariff effective June 21
Thousands of Barrels per Day
Thousands of Bbl per Month
"True" Exports Exceeding "True" Imports
True Imports Exceeding "True" Exports
"True" Exports & Imports in Terms of Crude Oil
Crude-Gasoline Ratio= 3 to 1

Total U. S. imports and exports and gasoline imports and exports in relation to true exports exceeding true imports.

Federal Government Proration Enforcement

ON JULY 12, 1933, President Roosevelt, under the authority granted by NIRA (Industrial Recovery Act) issued an order curbing illegal crude oil overproduction by prohibiting the shipment in interstate and foreign commerce of petroleum and its products produced or withdrawn from storage in violation of state proration regulations. The penalties for violation of the order are $1,000 fine or imprisonment for six months, or both.

The executive order of the President reads:

> By virtue of the authority vested in me by the act of Congress entitled 'An Act to Encourage National Industrial Recovery, to Foster Fair Competition and to Provide for the Construction of Certain Useful Public Works and for Other Purposes,' approved June 16, 1933 (Public No. 67, 73d Congress), the transportation in interstate and foreign commerce of petroleum and the products thereof produced or withdrawn from storage in excess of the amount permitted to be produced or withdrawn from storage by any state law or valid regulation or order prescribed thereunder, by any board, commission, officer or other duly authorized agency of a state, is hereby prohibited.

The order marks the first step by the federal government to stabilize conditions within the oil industry and is therefore of great importance. The order will have an immediate sobering effect upon the violators of state laws.

On July 14, 1933, Secretary of the Interior H. L. Ickes was appointed by President Roosevelt to enforce the order prohibiting interstate and foreign shipments of hot (illegal) oil and its products and the Secretary on July 16 issued drastic regulations designed to prevent such shipments. The regulations require detailed monthly statements by every producer, purchaser, shipper and refiner of petroleum and products. All transportation agencies, including rail, pipeline, water, truck or any other means of conveyance, are ordered henceforth to require from all shippers an affidavit showing the source of shipment and a statement that products tendered for shipment have been produced within state proration orders.

The Department of Interior moved swiftly in actual enforcement of the order when A. D. Ryan was appointed and dispatched on July 17 as a special agent in charge of the investigating force of the department in the East Texas field. Mr. Ryan was accompanied by N. L. Meyers and J. Howard Marshall of the solicitor's office to prevent injunction suits against Federal regulations. By July 21 the tank car shipments from the East Texas field declined to 10 per day, from the formerly prevailing rate of about 600 per day. There was an apparent reluctance on the part of former sellers and buyers of illegally produced oil to be the first to test in courts the authority of the federal government by violating the President's order, more particularly with enforcement officers of the Department of the Interior desirous of exemplary action. Moreover, it is unlikely that local courts will allow injunctions against federal regulations, while on appeal it is highly improbable that the U. S. Supreme Court will nullify a law after Congress passed it under the stress of "national emergency productive of widespread unemployment and disorganization of industry, which burdens interstate and foreign commerce, affects the public welfare and undermines the standards of living of the American people."

Texas Proration Effective

DURING JULY proration enforcement in the East Texas field under the order of June 13 allowing the pool 548,000 bbl. per day was very gradually being tightened; but still, from 150,000 bbl. to 200,000 bbl. per day was produced and transported illegally during the first 20 days of the month.

The order of President Roosevelt prohibiting shipment of illegally produced crude oil and its products in interstate and foreign commerce, and the prompt and effective enforcement of the order by the Department of the Interior, almost entirely eliminated the illegal production in East Texas field by July 21, primarily because formerly the Railroad Commission was powerless to control interstate and coastal shipments. A reduction of East Texas allowable to around 400,000 bbl. per day is anticipated as a result of the effective enforcement.

On July 10 the Overton Refining Company and 31 other complainants filed a suit in Federal Court at Tyler contesting the present proration order of the Railroad Commission permitting the East Texas field 548,000 bbl. per day. It is anticipated that the plaintiffs will not be granted an injunction and that the suit may become a test case carried to the U. S. Supreme Court for final determination of the powers and limitations of the Texas Railroad Commission.

On June 30 the Three-Judge Federal Court at Amarillo handed down a decision denying an injunction against the Texas Railroad Commission to the Danciger Oil and Refining Company, thus sustaining the Commission's proration orders in Texas Panhandle oil fields. The court's opinion held that the Texas legislature has power to control natural resources of the state and that the Railroad Commission is the duly delegated agent of the legislature.

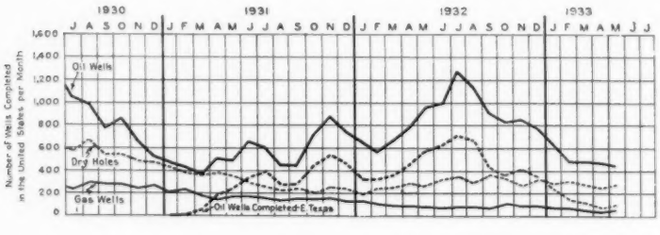
Recent Discoveries Opened for Production in Oklahoma

PRORATION enforcement continued effective in Oklahoma oil fields during July without any major injunction suits filed against the Corporation Commission.

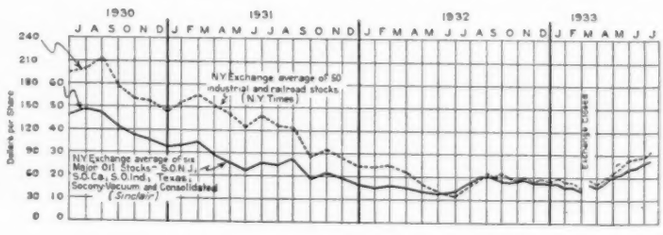
For August and September the daily allowable production of the state has been placed at about 602,000 bbl. per day, the highest allowable in several years. The allowable of the Oklahoma City field has been increased to about 251,000 bbl. per day, a rate of production which will unquestionably damage the field and will accelerate the time when it will stop flowing naturally.

Of particular importance has been the opening by the Corporation Commission of

U. S. drilling: comparison of oil wells, dry holes, and gas wells.


1930
1931
1932
1933
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J
Number of Wells Completed in the United States per Month
Oil Wells
Dry Holes
Gas Wells
Oil Wells Completed-E. Texas

Six major oil stocks in relation to 50 industrial stocks on the New York Stock Exchange.


1930
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Dollars per Share
N.Y. Exchange average of 50 industrial and railroad stocks. (N.Y. Times)
N.Y. Exchange average of six Major Oil Stocks—S.O.N.J., S.O.Ca., S.O.Ind., Texas, Socony-Vacuum and Consolidated (Sinclair)
Exchange Closed

the six "wildcat" pools, formerly limited to 50 bbl. per well per day. The potentials and the allowables of the six recent discoveries are indicated on the accompanying table.

Proration of Recent Oklahoma Discoveries

Field	Number wells	Potential Production bbl.	Allowed Production bbl.	Percent Prorated
Lucien	5	18,512	8,000	56.8
East Earlsboro (Calvin sand)	10	7,813	3,907	50
Sasakwa Townsite	1	2,712	1,356	50
Marshall-Roxana (deep zone)	4	1,242	1,242	open
Keokuk Falls	1	2,061	515	75
Fish Extension	1		500	

Only one pool opened for production, the Lucien, can be classed as at all important, the remaining five areas being of little commercial value and expected to be in the stripper class after a few months of production. Opening of the discoveries, however, will have a stimulating effect upon the reconnaissance drilling work in the state of Oklahoma, which lost most of its active wildcatters by allowing discovery wells but 50 bbl. per day, while in Texas new pools are not prorated at all until their production exceeds 10,000 bbl. per day.

The official reports of the potential 48-hour tests of Class B pools in the Greater Seminole area indicate a total potential of 244,537 bbl. per day, a decline of about 20.85 percent under the potentials of November of 1932, indicating a monthly drop of 2.98 percent. It is considered probable that with current allowable of the Class B fields of 145,384 bbl. per day the Greater Seminole area will have an actual potential of about 175,000 bbl. per day by the end of the current year, thus making its proration unnecessary.

Tomball—Texas Gulf

EVEN THOUGH proven for crude oil production from the Cockfield formation the Tomball field continues to remain of questionable importance.

Up to July 25, 1933, only one satisfactory commercial producing well was completed, Magnolia Petroleum Company (Socony-Vacuum) and Humble Oil and Refining Company (S.O.N.J.) No. 1 Kobs in J. M. Hooper survey, which was brought in in June for 1,660 bbl. per day initially. Three and a half miles due north northeast from No. 1 Kobs, the same companies completed as a dry hole their No. 1 Martens; Humble Oil and Refining Company No. 1 Fritz Kobs, the west offset of the discovery test, was brought in on July 10 for 37 bbl. per hour in the sand from 5,554 to 5,575 ft., but began cutting four percent salt water soon after completion; Humble and Magnolia companies' No. 1 Rudel in Joseph House survey, halfway between the discovery well and the abandoned No. 1 Martens, and structurally the highest well in the area, developed into a dry gas well estimated as making 20,000,000 cu. ft. per day; also Humble's No. 1 G. H. W. Martens in William Hurd survey, one mile west from the discovery well, developed into a 15,000,000 cu. ft. dry gasser.

Several additional wells are approaching the Cockfield formation and should test it more definitely before the end of August, though at this time the prospects are not too bright because dry gas wells are not indicative of large crude oil reserves in the Cockfield formation, while deeper horizons are of unknown value. The unusually large amount of capital spent in the Tomball area prior to its discovery, and since then, gives momentum for a fast development program to justify former expenses, even though under normal circumstances the proving up of such uncertain prospect would have been far more cautious.

Crescent—Central Oklahoma

GYPSY OIL COMPANY (Gulf) and Carter Oil Company (S.O.N.J.) No. 1 Miller in section 28—T17N–R4W in Logan County discovered an apparently major oil pool when it was completed for 6,000 bbl. of light gravity crude and 7,500,000 cu. ft. of gas per day from the Simpson sand of Ordovician age at from 6,120 to 6,141 ft. Two new projects were started upon completion of No. 1 Miller.

The new field is not unitized like the Lucien pool and consequently it will be developed much faster if it proves to be in a major class, more particularly because leases are owned by many companies and are split in small parcels of from 40 to 160 acres. A tentative agreement by owners of offsetting leases to space wells one to 40 acres will go, however, a long way to prevent an excessive and wasteful drilling campaign and regulation by the federal government will act as a brake.

The Crescent pool is the first major discovery in the state of Oklahoma during the current year. The new field is situated on a major producing trend, the buried Nemaha granite ridge, on which are located such major pools as the Oklahoma City (30 miles SSE), the Garber (35 miles N) and Marshall-Roxana (11 miles N).

Michigan

THE PRODUCING area of Central Michigan scored during July a major 50-mile northeastern extension when A. Webber's No. 1 Wilcox in Ogemaw County tested about 200 bbl. per day naturally from Traverse limestone topped at 1,725 ft., thus opening a new pool and adding greatly to the crude reserves of Michigan.

In the Porter field in Central Michigan two large Dundee limestone completions were recorded; Pure Oil Company brought in its No. 1 M. Naramore in Section 15 for estimated 5,000 bbl. per day from 3,431 ft. and McClanahan Oil Company completed its No. 1 Hathaway in section 17 for 1,700 bbl. per day from 3,413 ft. Of considerable importance also was the completion of the first Traverse limestone oil producer in Central Michigan in the Porter field when Stewart and Gordon No. 1 Richmond in section 22 was brought in for 300 bbl. flowing naturally from 2,900 ft.

BASIL B. ZAVOICO

MEXICO

Exports and Taxes

EXPORTATION of petroleum and products in 1932 which totaled 22,587,893 bbl. of which 9,744,915 bbl. were heavy crude; 7,381,711 bbl. fuel oil; 2,132,700 bbl. refined gasoline; 1,087,019 bbl. gas oil; 1,008,796 bbl. refined kerosene; 832,633 bbl. (equivalent) asphalt; 397,962 bbl. lubricants; 2,126 partially refined kerosene; 25 natural gasoline, and six, light crude, were shipped chiefly to the United States (43.5 percent), the Bahama Islands (21.1 percent); Argentina (9.6 percent) and Germany (8.4 percent), reports the special taxations department of the Ministry of Finance. Department announces that the federal government's income in 1932 from production taxes on exported oil was 4,971,893.63 pesos (some $1,650,000 U. S.), against 3,964,445.37 pesos in 1931, and its revenues last year from export levies were 2,463,560.85 pesos (about $821,000, U. S.) against 2,453,573.52 pesos in 1931. According to the department, Mexico consumed 273,976,783 liters (3.7853 liters equal one American gallon) of gasoline, of which 78,874,974 liters were imported. This gasoline consumption, greater than the 258,033,121 liters used in 1931, at the consumption levy of six centavos (about two cents) the liter, a fund which is employed entirely for road construction and mainte-

Mexican Eagle's narrow gauge railroad from the Gulf to Mexico City: Cazones River may be seen on the right.

nance, afforded the federal government 16,438,606.98 pesos (about $5,400,000, U. S.).

Refinery Construction

THE ADMINISTRATIVE CONTROL of National Petroleum (Federal agency) announces that it has obtained a permit to erect a 2,000 bbl. daily capacity refinery at Atzcapotzalco to cost $150,000 to $225,000 U. S. The refinery will draw its crude supplies from federal oil reserves along the San Luis Potosi City—Tampico branch of the National Railways of Mexico, transport them by tank car to the projected refinery and sell the products in the Federal District, largest market in Mexico. The new refinery is expected to be in operation by the end of this year. Recently the Administrative Control completed a refinery at Tampico.

A small refinery, producing gasoline, kerosene, gas oil and fuel oil has begun operation on the American border at Nuevo Laredo under the ownership of Jose P. Cavazos and Alfredo Fernandez. An experimental plant at the same city has begun production of lubricating oils, owned by Enrique Resendez.

Exploration

CACALILAO field in Vera Cruz state has been considerably extended by the completion of a well at a depth of 1,953 ft. with an initial daily production of 1,000 bbl. by the Gulf Coast Corporation. Due to irregular disposition of the productive structures resulting in dry holes adjacent to producing wells a large part of this field, potentially productive, has remained unexplored, according to the Ministry of National Economy.

The petroleum department of the Ministry announces that strong evidence of the occurrence of oil south of San Blas on the Pacific is being investigated by the government.

Administrative Control announces the completion of a 1,200 bbl. daily producer in Choapas field, southern Vera Cruz.

MEXICAN RAILWAY, British owned line operating between Mexico City and Vera Cruz has obtained authorization to raise rates on crude and products 10 percent thus affecting principally imports being shipped to the capital.

A reward of 1,000 pesos ($300) has been offered by the Vacuum Oil Company of Mexico to anyone proving that the Mobiloil and Gargoyle marketed by their company in Mexico are not imported. The company is taking these steps in an effort to destroy the rumor that Vacuum products, marketed in Mexico, were not in all cases imported.

An investigation has been ordered by President Rodriguez of charges brought by the Mexican Automobile Association that highway construction and repair work for which the federal government has furnished money to the states from the gasoline tax, is being delayed because the states have spent the money on other projects.

A robbery of a $6,600 payroll destined for the Agua Dulce camp in Vera Cruz state of the Mexican Eagle company has been reported. The theft took place on a river launch by men who had boarded the boat as passengers. Efforts are being made to trace the pirates by the naval authorities.

A river tanker and cargo of 5,000 bbl. of petroleum, said to be worth $8,000 U. S., was destroyed by fire as a result of a gasoline tank explosion on the Tamesis River.

DOUGLAS GRAHAME

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ROUMANIA

BUCHAREST

THREAT of expropriation of Concordia's crude oil pipelines has drawn the petroleum companies of Roumania together in protest against such action on the part of the government. Although complaints have hitherto been expressed against the high rate charged by Concordia for transportation of crude, fear of government interference has caused this matter to be temporarily forgotten while every effort is being made to prevent nationalization of the pipelines of the most important oil transportation company in Roumania. Moreover, Concordia has committed itself to a reduction in rates if the government drops its plans in regard to the company's lines. These rates have remained the same as they were when the value of the crude transported was very much higher than at present.

Several factors combine to cause the major companies operating in Roumania to desire the government to leave Concordia's pipelines under control of that company. It is pointed out that with state finances in their present weak condition, the money that would have to be paid to the company could be spent to better advantage in improving the harbor of Constanza or in the construction of a gasoline pipeline. While Concordia is the largest pipeline company in Roumania, other major companies have pipelines running parallel to those of Concordia and these companies fear that the government would eventually be forced to take over their lines as well, to avoid competition from more efficient managements. This brings up also the question of the poor management that the pipelines would receive under government supervision which is the principal objection to the contemplated step. The high rates and poor administration that mark the operation of the government controlled Baicoi-Giurgiu crude pipelines is an indication of what producers might expect from government ownership.

In addition to the muddle that the public authorities might make of the transport system, they would also have to lay out vast sums of money as the Mining law does not provide for the nationalization of accessories such as pumping stations and tank farms and these would have to be built by the government. Concordia threatens to discontinue all exploitation if the measure goes through and other companies fail to see the purpose in disorganizing transportation just at a time when production is again on the increase. A careful consideration of the legality of such a step on the part of the government is published in MONITEUR DU PETROLE ROUMAIN, issue of July 1 which concludes that there is no legal justification for such action.

Production

CONCORDIA is now the largest producing company in Roumania with a daily production of crude approximately 30,628 bbl. or 12,616 bbl. in excess of its quota under the terms of the Paris agreement. Following the withdrawal of the Roumanians from this agreement, Concordia and Prahova are considered to have opened production practically to the maximum. The other companies while producing in excess of their quotas still appreciate the value of restriction to a certain extent.

Roumanian Daily Crude Production by Companies

(Barrels)

	Current Production	Agreement Quotas
Astra Romana	28,120	22,420
Steaua Romana	22,800	22,040
Romano Americana	17,480	14,060
Unirea	15,960	15,732
Creditul Minier	10,640	11,248
Prahova	10,868	5,320
Colombia	6,460	6,764
Concordia	30,628	18,012

E. I. MARGULIUS

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RUSSIA

Official Figures for Soviet Oil Operations *

	Crude Production (Bbl.)	Daily Average (Bbl.)	Run to Stills (Bbl.)	Drilling (Ft.)
January	10,382,400	334,917	9,510,900	157,486
February	10,162,600	362,950	9,167,900	169,396
March	11,928,700	384,800	11,003,300	228,532
April	11,824,400	394,150	10,472,700	228,790
May	12,794,600	412,729	11,834,900	213,744
June	12,489,400	416,313	11,641,700	198,729
Total 1st half, 1933	69,582,100	384,431	63,631,400	1,196,679
Total 1st half, 1932	78,750,000	432,693	74,718,000	1,347,437
Revised Quota 1933	170,800,000	467,670	155,000,000	3,315,000

* Crude oil conversion ratio: seven barrels = one metric ton.

APPROXIMATELY 70,000,000 bbl. of crude oil were produced in U.S.S.R. during the first six months of 1933 against 85,400,000 bbl. as expected by the plan. Baku oil fields contributed to the six month's total, 45,000,000 bbl.; Grozni, 18,000,000 bbl.; Maikop, 1,250,000 bbl. and all other fields 5,332,000 bbl.

Lok Batan

ATTENTION not only in Russia but in all parts of the international petroleum industry is at present directed toward the remarkable performance of well No. 45, at Lok Batan under the control of Azneft, which continues to produce at the rate of 105,000 bbl. to 140,000 bbl. of crude per day enabling Baku to meet and surpass the production quota required by the Second Five Year Plan. This well, a complete description of which is given elsewhere in this issue by Professor Perms, chief geologist of Azneft, and which was referred to last month in these notes, is producing from the Pliocene "Oil Measures" from a depth of about 1,725 ft. with additional productive horizons below the present producing area. Early in June production from well No. 45 temporarily ceased, due to sanding up; but on the day following, the well again blew in as a result of accumulated gas pressure and has since been producing about 140,000 bbl. per day.

Geologists expressed the opinion that part of the potential production had been cut off by sanding up and that eventually cleaning out would be necessary. Already a new derrick has been completed to replace the original one which was destroyed by the force of the gusher.

Work on other wells, which was stopped while all efforts were concentrated on controlling and handling the huge production from No. 45 has since been resumed and six additional wells are being drilled in this area. Well No. 46 has also been affected by the sanding of the original gusher but with the completion of cleaning operations considerable production is anticipated from this well and from wells Nos. 16 and 124 which have given promising indications.

Lok Batan and Kala are potentially the most important producing fields in Soviet Russia; both are controlled by Azneft and every effort is being concentrated on these fields as the most promising under exploration as they combine tremendous potential production with easy accessibility in a section where pipelines, refineries, and shipping facilities are already developed. Professor Gubkin, perhaps the most important geological authority in Russia, points out that the question of developing oil production in the neighborhood of mud volcanoes has long been under consideration and is now practically settled by the production of well No. 45 drilled near a mud volcano. The entire southeastern portion of the Trans-Caucasus, including Kabristan and Saliani steppes, is profusely covered with mud volcanoes which, hitherto, has been considered a strict limitation on drilling. With the success of efforts in the Lok Batan area a new theory on the presence of oil in connection with these mud volcanoes is given strong practical support thus opening up a huge area for further exploration, close to existing facilities for handling the oil that may be produced.

The Kala area, referred to above as of growing importance, has two wells, No. 21 and No. 17 producing together at the rate of over 21,000 bbl. per day through a narrow choke. The field has 19 wells in an area of 500 hectares. Geological exploration by the most modern methods indicates an area of about 3,000 hectares which will be turned over for commercial exploitation about the first of next year, when exploration will have been completed. M. Barinov, chairman of Azneft, in stating that Lok Batan and Kala together are expected to produce between 20 and 40 percent of Azneft's quota for 1934, points out that the Kala area will become of equal or greater importance than the present Surakhani field.

Baku

PRODUCTION at Baku for the first half of 1933 managed to exceed the plan, official figure for fulfilment being 101.7 percent. Production increased steadily during the first six months being considerably assisted during the last two months by the completion of the Lok Batan well.

Daily Average Production in Baku by Months

	(Barrels)
January	212,730
February	272,292
March	257,292
April	270,830
May	293,930
June	297,290

This oil trust will have to improve daily production still further during the second half of 1933 to meet the requirements of the plan; crude production will have to reach 308,000 bbl. daily. In addition to the new areas mentioned above, which will help to supply this increased demand, there are 500 small producers which have been dismantled to supply pipe for other areas. These will be brought under production during the next half of the year. Another measure undertaken by Azneft is the creation of a division for forcing new wells into production and a division for mechanizing production. These two special divisions are expected to increase efficiency in exploration and exploitation.

PLAN fulfilment at Grozni has been far less satisfactory, being at the rate of 78 percent for the first half of this year. Production has averaged about 90,000 bbl. daily during this period. While reports from the fields have given the same reasons for this failure to meet the plan as have been published in WORLD PETROLEUM in the past—inefficiency, poor technical supervision, poor equipment and lax discipline; and have supported these claims with figures showing 12 percent of normal working time used in the repair of unnecessary breakdowns—actually it is becoming apparent that the Five Year Plan overestimated the capacity of old Grozni fields to produce. During the Second Five Year Plan Grozni was expected to produce about 50,000,000 bbl. in 1933, 65,000,000 in 1934, 75,000,000 in 1935, 80,000,000 in 1936 and finally 95,000,000 bbl. in 1937. While a sufficient quantity of oil to meet these demands may be present in this area, the plan fails to take into account the complexity of the structures and the difficulties of drilling in the North Caucasus.

An equally ambitious and seemingly impossible refinery program was also laid out for Grozni; but this department of the trust has actually completed the capacity established for it, amounting to slightly less than 100,000,000 bbl. per year with cracking capacity which is now in excess of that at Baku. Provision was also made to have Grozni crude carried to Armavir, the Don Basin and Moscow for refining. With such refining capacity and a production that promises not to exceed 40,000,000 bbl. for 1933 it is obvious that the plans in relation to Grozni have not been properly synchronized. Correcting the discrepancy would take over 12 months.

Lack of Synchronization

THE REVERSE of this situation exists at Baku where production has kept pace with the plans but refining capacity is not prepared to handle it. Baku and Batum refining capacity has been stabilized at about 110,000,000 bbl. and production in excess of that figure was to be transported to Samara, Saratoff, Gorki, and Yaroslavl for refining. As none of these plants has been completed the refining capacity of Baku and Batum has already been strained to a point where reports from the consuming centers have complained of the quality of the products.

Central Committee Reports

THE CENTRAL COMMITTEE of the Communist Party keeping a watchful eye on the progress of the oil industry reports that the technique required by modern installations and drilling practices has not yet been mastered, thus wasting many of the benefits of the work done during the first Five Year Plan period. In summing up the situation the Committee indicates that during the first period all emphasis was placed on the construction of new and efficient refining plants and the introduction of deep drilling by the most modern methods. There was no time then to master the technique of handling these new tools and the completion of each new installation was hailed as a victory.

During the second period, now in progress, the reorganization of the industry was completed and the operation of the new plants, the use of new tools for deeper drilling, and other improvements were expected to proceed. In this, however, the plans have not been completely satisfied, principally because no real effort was made to acquire the technical knowledge necessary to get the best results from the reorganized industry. In deep drilling, over 7,000 ft., gave rise to the necessity for readjustments that the workers were unable to make. Compressors and pumps were unsatisfactory and deep drilling has remained one of the most backward divisions of the industry in Russia. Refineries erected by American firms, or modeled after their construction have been in operation but with a poor efficiency far below that achieved by the plants when on test under the supervision of the foreign engineers who directed their construction. Specified capacities are not being reached and the quality of products is not equal to that obtained in the tests.

Another difficulty is encountered in obtaining replacements from domestic machine shops which have so far been unable to turn out parts that will be entirely satisfactory in operation.

Working under the same conditions and using the same charging stock plants turn out different percentages of end products having different specifications. Stabilization of cracked gasoline has not been studied at all; at Grozni no decision has been reached on the method of dewaxing cylinder stock although the Alco units there are already under steam; cracking units at Batum have no rerun facilities and one of the units has to be used for this operation resulting in lower quality of the end product.

Current Events

GURYEFF. The Caspian Sea-Orsk pipeline is proceeding satisfactorily with every prospect of being completed in 1933. The main line has been redesigned extending it to 758 km. while with new connecting lines to Emba fields the total length will be over 1,000 km. The Orsk terminal and refineries are being constructed at present.

LENINGRAD. The Sakhalin expedition mentioned in the June issue, reported to the Petroleum Institute that it had uncovered good prospective drilling area 37 km. north of Aleksandrovsk.

A Russian engineer has completed work on an internal combustion engine that is said to operate both on light and heavy fuel and to be useful for light passenger cars or heavy transportation. Demonstrations will be held shortly in this city.

GROZNI. A domestically constructed gasoline absorption plant has been brought under operation here, fitted with the most modern automatic control devices and modeled after Alco designs.

J. WEGRIN

CANADA

Imports

IMPORTS of crude into Canada during the month of May, 1933, show a heavy increase over April; but are down compared with the same month in 1932. During May of this year 2,399,747 bbl. were imported, compared with 1,033,926 bbl. in April, and 3,129,086 bbl. in May 1932. Total imports for the twelve month period ending May of this year are 22,712,997 bbl. compared with 28,783,945 bbl. in the corresponding period of last year.

Origin of Canadian Crude Imports During May

	Barrels
United States	1,716,846
Colombia	351,568
Peru	116,016
Venezuela	215,032

Gasoline imports showed an increase also, being 155,770 bbl. compared with 51,558 bbl. in April, and 244,109 bbl. in May 1932. Total imports for the 12 month period ending May 31, 1933 were 1,714,821 bbl. against 2,404,487 during the corresponding period the year before.

Imperial Oil Personnel Changes

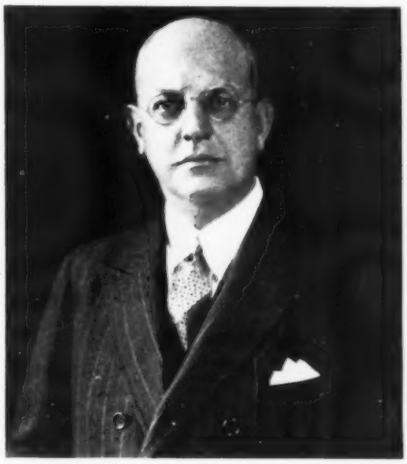
UNDER a new ruling adopted by Imperial Oil Limited, all employees irrespective of rank will retire with pension at the age of sixty-two. The primary object of this policy is to speed employment, and the first high executives of the company to be subject to it are C. O. Stillman, President, who retires this year after fifty-two years of experience in the oil industry, and Alex M. McQueen, vice-president, who accompanies Mr. Stillman into retirement. Both executives were the recipients of presentations and good wishes at the annual meeting of the company.

Mr. Stillman is succeeded by G. Harrison Smith as President of Imperial Oil Ltd. Mr. Smith is already president of International Petroleum Limited, and a director of Standard Oil of New Jersey, and is therefore an international figure in the oil industry of the world. He entered the oil business in 1898, while still a boy, and served in various capacities connected with the accounting and sales phases of the industry. In 1911, he was elected vice-president of the West India Oil Company. In 1914 he became a vice-president of Imperial Oil, and held a similar position with International Petroleum. He became president of the latter company in 1917, and it was under his direction that the remarkable growth of the company began, and was carried through.

Victor Ross succeeds Mr. Smith as senior vice-president of Imperial Oil. As a journalist in various capacities Mr. Ross had already made his mark before he entered the oil business in 1918 as assistant to W. C. Teagle. In 1919 Mr. Ross was made a director of Imperial Oil, and later became vice-president of that company as well as of International Petroleum. His broad knowledge of the human element makes him specially beloved among the executives and employees of the company.

Two new vice-presidents have been elected in the persons of Richard V. LeSueur and Clarence A. Eames. Mr. LeSueur was formerly a director of International Petroleum, and has a wide experience as a corporation lawyer, with a special knowledge of the laws of South America. He has been retained as general legal counsel for International Petroleum for some years.

Clarence A. Eames entered the oil industry thirty-six years ago with the Atlantic Refining Company. Later he joined the Anglo-American Company of London, England, and became a director in 1912. He became a director of Imperial Oil, and International Petroleum in 1921. He is an expert in foreign trading, and in transportation problems. R. C. ROWE



C. Harrison Smith

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FINANCE

New York: July

THE LONG awaited reaction took sudden and violent possession of the security and commodity markets in the third week of July. A frenzied wave of speculation in the first two weeks of the month in the so-called repeal stocks, comprising the distillery and alcohol issues, left that portion of the list in a very vulnerable position when speculators attempted to take profits upon the repeal votes of Alabama and Arkansas. The unsettlement in these issues induced profit taking in other directions, which disclosed that practically all groups had been overbought. The break in prices covering the three days from the 19th to the 21st was one of the sharpest on record, carrying the New York Times averages from above 97 to below 77 and erasing over 40 percent of the advance from the lows of the end of March.

Meanwhile the Administration at Washington has been endeavoring to hasten the organization of industry under the National Industrial Recovery Act, seeking to support and stimulate business through the primary expedient of increasing purchasing power by expanding wages and employment. The U. S. dollar registered further depreciation in terms of gold currencies and declined in relation to the pound sterling until that unit approximated its former dollar value of 4.86. These influences, however, were overshadowed by the internal condition of the market.

The oil shares provided no exception to the action of the market as a whole and receded quite substantially from their year's highs. Earnings statements covering the second quarter and first half year were for the most part unfavorable in comparison with 1932, but the second quarter was better than the first and June is reported to have been much the best month of the year to that time.

FOR THE FIRST six months of this year Union Oil Company of California reported net earnings of $200,000, or 5 cents a share, compared with $1,500,000, or 34 cents a share in the first half of 1932. The second quarter, however, includes an item of non-recurring profit of $1,350,000 representing book profit from sale to Standard Oil Company (New Jersey) of its half interest in Union Atlantic Company. This company, jointly owned by Union Oil and Atlantic Refining, was the holding company for the marketing interests of the two parent companies in New Zealand and Australia. The acquisition of this unit by the Jersey Standard is the most important step of expansion of the foreign business of the latter since purchase last year of Pan American Foreign. Both Union Oil and Atlantic Refining are thereby relieved of their contingent liability under their joint guaranty of the $40,000,000 of Union Atlantic bonds.

Exclusive of this non-recurring profit, Union showed a loss of $50,000 in the second quarter, compared with loss of $1,100,000 in the first quarter and a profit of $550,000 in the second quarter of 1932. President St. Clair stated that "As the result of improved conditions now prevailing current operations are being carried on at a profit."

Current assets on June 30 were $48,500,000, including $15,400,000 in cash and equivalent, and current liabilities were $5,150,000. During the first half indebtedness was reduced by about $3,000,000, current liabilities being cut about $625,000, bonded debt $1,175,000 and purchase obligation notes $1,200,000. Capital expenditures totaled about $1,200,000.

Sales of all products in the half year were 13,700,000 bbl., valued at $24,200,000, compared with 14,700,000 bbl. valued at $28,600,000 in the first half of last year.

THE PRELIMINARY report of Atlantic Refining Company for the first half of 1933 shows a loss of $1,002,000 after charges and including a non-recurring profit of $1,320,000 from the sale of its interest in Union Atlantic (referred to above). In the first half of 1932 there was a profit of $3,185,000, equal to $1.18 per share on the capital stock.

ALTHOUGH still covering its $1.00 per annum dividend requirements, Sun Oil Company reported a substantial decline in its half year statement, net amounting to $1,138,892 equivalent to 53 cents a share on the common, compared with net of $2,230,918, or $1.13 a share, in the first half of 1932.

IT WAS REPORTED in July that Phillips Petroleum was operating in the black due to the better oil prices that set in about the middle of June. Nevertheless, the statement for the second quarter is expected to show a loss comparable with the deficit of $2,179,000 reported for the first quarter.

SEABOARD OIL COMPANY of Delaware reported net of 42 cents a share for the first half of this year, compared with 30 cents a share for the same period of 1932. The second quarter yielded 18 cents a share, an unseasonal decline from the 24 cents of the first quarter but a slight improvement over the 16 cents of

the June quarter of 1932. Financial position continued very strong.

TIDE WATER ASSOCIATED Oil Company earned $1,413,082 in the second quarter of this year, equal after preferred dividends to seven cents a share on the 5,611,040 common shares, compared with net of $1,572,097, or 10 cents a share, in the June quarter of 1932. For the first half, the profit was only $174,355, equal to 26 cents a share on the preferred stock, compared with net of $2,099,700, or $3.13 per share of preferred, for the first half of 1932.

Current assets on June 30 totaled $46,922,671, including cash and U. S. Government and short term securities of $8,924,684, and were more than five times total current liabilities. Product inventories, at lower than market, were $23,004,068.

SIMMS PETROLEUM is expected to report for the June quarter a net loss of about $175,000, which will compare with a loss of $238,899 in the first quarter and loss of $60,259 in the second quarter of 1932. During the period the company purchased about 33,000 shares of its own stock at a cost of $205,000.

THE ROYAL DUTCH six percent ordinary dividend for the year 1932 results in an indicated distribution on the New York shares of $1.075 a share payable August 14 to stock of record July 31. If this distribution is not ruled exempt from the provisions of the National Industrial Recovery Act with regard to excise taxes on corporation dividends, the five percent tax will be withheld and the distribution will amount to approximately $1.02 per N. Y. share.

C. C. BAILEY

Paris: July

THE upward movement of oil shares which has characterized the Paris Bourse during the past few months continues undaunted in face of all odds. Neither the poor results obtained at the World Economic Conference, nor the renewed activities of the French State in attempting to establish an oil monopoly appear to have engendered more than a passing oscillatory movement upon the stock market.

In point of fact the very sudden rise of the United States crude oil prices coming upon the heels of President Roosevelt's proration measures has had a most stimulating effect upon the Bourse and appears to be the mainstay of the movement. If the rise continues and if the new legislative measures prove to be more effective than those applied hitherto, the outlook will be hopeful; but if prices collapse again in the States, it is more than probable that the reaction here will be severe.

As time goes by it becomes more and more evident that the autumn holds great changes in store for the French oil industry. If this could only be realized by its leaders their reactions to political and parliamentary intrigues to further a cherished project would be instantaneous and firm; as it is the Chambre Syndicale des Raffineurs has done little or nothing so far to enlighten public opinion as to the disastrous results which will attend the adoption of the monopoly. One is forcibly struck by the inertia which governs the acts of those who should be up in arms to protect the future of their industry at the present time.

MOST ENCOURAGING results have been obtained by the Société Générale des Huiles de Pétrole for the financial year ending December 31, 1932.

Gross profits amount to Fr. 99,356,286; net profits to Fr. 48,123,124; and after putting aside a sum of Fr. 35,959,281 for amortizements, there remains a balance of Fr. 12,163,843 on which a dividend of five percent is to be distributed.

Never, since the company was founded in 1921, has it shown such large gross profits. They have even exceeded those of 1929 (which was one of the most profitable years for most oil companies operating in France) by close to Fr. 9,000,000. Nevertheless, during the last four years general expenses have not increased as much as one would normally expect. They barely exceeded Fr. 11,473,304 in 1929, fell to Fr. 11,134,026 in 1930 and only attained Fr. 12,500,000 in 1931, at which figure they have remained.

The item which has increased with alarming rapidity—one might almost say fantastically—is *taxation:* whereas the French fisc only received Fr. 601,174 from the Société Générale des Huiles de Pétrole in 1921, in 1932 it levied Fr. 32,335,532. What better proof of the steady growth and of the vitality of the company?

In this connection, it is interesting to note that since 1921, the Société Générale des Huiles de Pétrole has spent Fr. 413,000,000 on its organization, plants, etc: Fr. 221,000,000 having already been written off, there now remains only the sum of Fr. 192,000,000 to be amortized on the company's balance sheet. This should be done readily enough for the Société Générale des Huiles de Pétrole's organization is now almost complete and future outlay will be more a matter of upkeep than of initial expenditure.

Owing, on the one hand, to depreciation of the pound sterling and, on the other, to partial payment of its debt to the Anglo-Persian Oil Company the Société Générale des Huiles de Pétrole has also succeeded in reducing considerably the burden of interest which had to be paid out each year on loans received.

Mr. Edgar Bonnet who presided over the annual meeting made an excellent speech on that occasion in which he pointed out that the oil industry had by no means solved its problems yet. He stated that owing to the industrial crisis in France, the consumption of lubricating oils had decreased considerably and that for the first time in its history, the company had seen the ascending curb of its gasoline sales arrested. In spite of this, the total tonnage of products distributed by the company showed a favorable balance thanks to a growing demand for gas-oil and furnace oils.

Speaking of the Lavera refinery, Mr. Bonnet said that building operations would soon be finished, that the plant would begin to function in July and should be in full working order by the beginning of 1934 when it would have a total capacity of 300 to 350,000 tons of crude per annum.

He then went on to explain to the shareholders the many difficulties with which the company had to contend not only on account of the quantities of alcohol which had to be taken over from the French state, but also with regard to the proposed oil monopoly, and

New York Stock Prices

1933 High	1933 Low	Current Div. $ per Annum	Stock (Par Value $)	June 19—July 22 Sales (Shares)	First	High	Low	Last	Net Change[1]
41¼	18½	2.00	Amerada (No)	96,800	38	41¼	27	30	− 5¾
31⅞	12⅜	1.00	Atlantic Refining (25)	383,400	27⅛	31⅞	21⅛	22⅝	− 3⅛
11	3	....	Barnsdall (5)	507,400	8¾	11	6½	7½	− ¾
4	¼	....	Colon Oil (No)	105,900	2	4	2	2⅛	+ ¼
15¾	5	....	Consol Oil (No)	1,396,000	13⅝	15¾	7¾	9¾	− 3½
19½	4⅞	....	Continental Oil (5)	849,300	14⅝	19½	12¼	14	+ ⅛
8⅝	2¼	....	Creole Petroleum (5)	151,500	6⅞	8⅝	5⅜	5½	− 1
62	24	....	Gulf Oil Corp. (25)	63,700	56¼	62	43	43¼	−10¾
88	40	2.00	Humble Oil & Ref. (25)	38,300	80	88	68	68	− 9¾
15¼	6½	0.50	Imperial Oil, Ltd. (No)	102,400	10⅞	15¼	10⅞	11⅝	+ ⅞
19⅞	8⅞	§0.28	International Petr. (No)	170,700	15¼	19⅞	14⅞	15¼	+ ¼
16	3¾	....	Mid-Continent (No)	237,300	11¾	16	10	10⅞	+ ⅛
17⅝	4¾	....	Ohio Oil (No)	581,900	14½	17⅝	10¼	11⅞	− 2⅛
17⅞	4¾	....	Phillips Petr. (No)	439,800	14⅛	17⅞	11	11⅞	− 1¼
11⅞	2½	....	Pure Oil (25)	388,000	8½	11⅞	7	8	.....
36⅜	17⅝	†6%	Royal Dutch N. Y. (13⅔)	38,500	26⅞	36⅜	26⅞	32⅝	+ 6⅞
33⅞	15	‡0.60	Seaboard Oil (No)	172,700	30	33⅞	19	20¼	− 8
11⅝	4	....	Shell Union (No)	582,200	7¼	11⅝	7	7⅞	+ 1
12⅜	4⅞	0.25	Simms Petr. (10)	58,800	10⅝	12⅛	7⅝	8	− 2⅛
9⅞	3	....	Skelly Oil (25)	22,500	8	9⅞	6	6	− 1⅞
15½	6	....	Socony-Vacuum (25)	1,367,900	11⅝	15½	9½	11	+ ¼
40⅛	19½	1.00	Standard Oil of Calif. (No)	353,900	34	40⅛	31⅝	33	.....
33⅞	17	1.00	Standard Oil, Ind. (25)	238,800	30	33⅞	28⅝	29¼	− ¼
24¼	12¾	....	Standard Oil, Kansas (25)	5,300	24	24¼	20½	20½	− 1½
19¼	8⅜	1.00	Standard Oil, Ky. (10)	70,500	16	19¼	15¼	16	+ ⅛
41⅛	22¾	1.00	Standard Oil, N. J. (25)	708,700	36¼	41⅛	33⅛	33⅜	− 2¼
50	35	*1.00	Sun Oil (No)	11,200	43	50	42¼	43	+ 1
28⅝	10¾	1.00	Texas Corp. (25)	466,500	22	28⅝	18¼	21	− ⅜
10¾	3⅛	....	Tide Water Assoc. (No)	506,400	8⅛	10¾	8	8	+ ⅛
23⅜	8½	1.00	Union Oil of Calif. (25)	199,600	17⅝	23⅜	16¾	18⅝	+ 1⅝
1½	⅛	....	Venezuelan Petr. (5)	37,300	1	1⅜	¾	⅞	.....

[1] Since close of last month's table. † Paid for 1932—no regular rate.
‡ Also 10c extra this year.
* Also paid 2% in stock for 1932.
§ Latest dividend—in Canadian funds.

finally assured them that no stone would be left unturned to protect their interests and, in this particular case, the interests of the public in general.

The meeting was ajourned after the shareholders had unanimously approved the accounts submitted to them and had decided to carry forward the balance of Fr. 4,158,878 left over after payment of the five percent dividend.

Messrs. Edgar Bonnet and Paul Houet were reelected directors of the company for a further period of six years.

Paris Bourse Prices

1932 Div.	1932 Par.	Share	June 11 to July 10 First	High	Low	Last	Change	Position on July 10, 1932
....	500 Lei	Astra Romana	75	91	71	88	+ 13	56
....	500 Lei	Colombia	71	86	67	73	+ 2	60
10 Lei	500 Lei	Concordia	50	69	50	67	+ 17	43
....	500 Fr.	Franco Pol. Pétroles act.	252	539	252	..	..	44
....	108	Franco Wyoming	214	231	198	218	+ 4	155
....	500 Fr.	S. G. des Huiles de Pétrolé act	391	445	391	420	+ 29	201
....	....	" " part	91	94	86	94	+ 3	52
....	500 Fr.	C. Française des Pétroles	510	528	510	515	+ 5	420
40 Fr.	500 Fr.	C. Industrielle des Pétroles	428	428	360	415	− 13	410
45 Fr.	500 Fr.	Lille Bonnières Colombes prio	780	810	755	780	..	634
20 Fr.	500 Fr.	" " ord	500	540	490	515	+ 15	332
....	....	Malopolska act	18	20	17	18	..	18
....	....	Malopolska part	94	101	86	96	+ 2	200
....	....	Mexican Eagle	41	49	29	42	+ 7	36
5 Fr.	250 Fr.	Omnium Inter. des Pétroles.	67	77	62	76	+ 9	66
50 Fr.	500 Fr.	Pechelbronn	308	308	281	301	− 7	330
45 Fr. B.	500 Fr. B.	Petrofina	426	448	419	448	+ 22	372
5 Fl.	1000 Fl.	Royal Dutch	17.600	20.100	17.100	18.575	+975	13.180
5 Fl.	100 Fl.	Royal Dutch 1/10	1.754	2.010	1.714	1.858	+104	1.315
1/5 d.	1	Shell	217	248	206	235	+ 18	173
....	500 Fr.	Steaua Française	341	352	320	340	− 1	223

At the annual meeting of the Compagnie Industrielle des Pétroles (affiliated with Vacuum Oil Company) dissatisfaction with the policy of the board in setting aside increasingly large sums for amortizements and reporting losses amounting to Fr. 12,263,162 for 1932 after writing off nearly Fr. 14,000,000 was expressed by one of the company's shareholders. This appeared to be the principal grievance, of several, that the shareholders have felt in the past few years whether justly or unjustly.

It is obvious, of course, that the shareholders are becoming restive owing to the prolonged absence of dividends. They have received only one during the course of the past four years, amounting to Fr. 40 declared in 1930 when the Compagnie Industrielle des Pétroles reported a profit of Fr. 10,837,729. It must be remembered that, although the Frenchman does not mind occasionally indulging in speculation, he likes to get a regular, if modest, return for his money and the continued absence of a dividend which brings in its wake a depreciation of the company's share value can become a grievance if he is not firmly convinced of the absolute necessity of such a course.

Mr. Halphen, speaking for the board at the meeting, endeavored to explain that the Compagnie Industrielle des Pétroles had had an extremely hard year. He drew shareholders' attention to the more or less abhorrent negotiations which had taken place between American and Roumanian producing companies and the resulting instability of the French oil market. He pointed out that building operations on the Frontignan refinery, the erection of several service stations, as well as a great number of new gasoline pumps all over the country had necessitated heavy expenditure and that, in consequence, the amortizements made were fully justified.

By way of encouragement, Mr. Halphen informed his audience that since 1929 the sale of the company's products had increased from 1,008,000 bbl. to 1,505,000 bbl. without the full importing quota having been attained. He also stated that cost prices had been reduced owing to the development of transport facilities now owned by the Compagnie Industrielle des Pétroles.

In reply to certain questions as to the origin of the products sold by the company, Mr. Halphen was in a position to assure shareholders that these had not been bought from the Vacuum Oil Company at an exaggerated price and to the detriment of the Compagnie Industrielle des Pétroles as had been suggested by a shareholder. He asserted that products were bought on the Roumanian and the Russian markets, indifferently, and that of a total of 1,540,000 bbl. the Vacuum Oil Company had only supplied 98,000 bbl. at a time when the Compagnie Industrielle des Pétroles could not find the qualities it required elsewhere.

Unlike the shareholders of the Société Générale des Huiles de Pétrole those of the Compagnie Industrielle des Pétroles did not find any particular source of encouragement in Mr. Halphen's speech beyond the fact that sales had increased and cost prices had been reduced. The meeting was adjourned after the accounts had been approved on a deficit of Fr. 12,263,163 which added to that of last year makes a total of Fr. 24,038,851.

At a special meeting held later in the day the company's life was prolonged for a further period of 99 years from May 16, 1934.

E. J. Andre

London: July

Remembering previous disappointments, the public has been slow to return to the oil share market, but the factors making for higher prices have finally attracted buyers, and a considerably increased turnover has been reported during recent weeks. Bullish influences have included the general strength of "equity" shares in London, hope of early results from application of the Industrial Recovery Act to the United States industry, increases in American crude and gasoline prices, and talk of an increase in the British petrol price level. Exchange uncertainties have been a restraining influence in some directions, although fear of depreciation of European currencies has undoubtedly helped Royal Dutch, Shells and other leaders by inducing "currency funk" buying from Continental centres. Some disappointment has been caused in the share market here at the failure of United States production to decline, and America will be watched closely in the immediate future for evidence that President Roosevelt's restriction measures are meeting with success. Prices generally have been strengthened during the past month by the excellent profit shown by Anglo-Persian for last year, and by the resumption of dividends on Phoenix. The big rise in Burmahs reflects

London Stock Exchange Prices

1933 High	1933 Low	Last Year's Div. % per Ann.	Share	June 12 to July 13 First	High	Low	Last	Change
2 3/32	1 5/32	3 1/2	Anglo-Ecuadorian	5/16	2 3/32	5/16	2 3/32	+ 3/32
1 5/16	1 7/16	10	Anglo-Egyptian "B"	1 15/32	1 5/8	1 7/16	1 1/2	+ 1/32
2 7/32	1 3/4	7 1/2	Anglo-Persian	1 29/32	2 7/32	1 29/32	2 7/32	+ 7/16
1 5/16	29/32	25	Apex Trinidad (5s.)	1 3/16	1 5/16	1 3/16	1 5/16	+ 1/8
1 7/32	1 1/32	....	Attock	1 5/32	1 7/32	1 5/32	1 7/32	+ 1/16
5/16	1/2	7 1/2	Brit. Borneo (6s.)	9/16	19/32	9/16	9/16	.....
1/4	3/16	....	Brit. Burmah (8s.)	7/32	1/4	7/32	1/4	+ 1/32
5/16	5/32	....	Brit. Controlled (85)	3/4	9/32	3/4	9/32	+ 1/32
1 3/16	1 3/32	....	Brit. Controlled Pfd. (85)	1 7/32	1 1/32	1 7/32	5/8	+ 3/32
4 1/32	2 3/4	20	Burmah	3 1/4	4 1/32	3 1/4	4 1/32	+ 2 3/32
1 1/32	3/4	....	Canadian Eagle (No par)	9/32	1 1/32	9/32	1 1/32	+ 1/16
9/32	3/32	....	Kern River (10s)	3/16	9/32	3/16	9/32	+ 3/32
2 3/8	1 1/2	12 1/2	Lobitos	1 25/32	2 3/8	1 25/32	2 3/8	+ 19/32
4 5/32	3 7/16	14††	London & Thames Haven	3 13/16	4 1/8	3 13/16	4 1/4	+ 5/16
7/16	3/16	....	Mexican Eagle (84 Mex.)	3/8	7/16	1 1/32	7/16	+ 1/16
2 1/32	3/8	2 1/2	Phoenix	1/2	2 1/32	1/2	2 1/32	+ 5/32
23 1/8	15 3/8	6	Royal Dutch (fl. 100)	20 7/16	23 1/8	19 3/8	21 3/4	+ 1 5/16
2 3/4	1 29/32	7 1/2*	Shell Transport	2 3/8	2 3/4	2 1/4	2 23/32	+ 1 1/32
11 3/4	5 7/8	....	Shell Union (no par)	9 1/2	11 3/4	8 3/8	11 1/8	+ 1 3/8
5/8	1 1/32	4	Steaua Romana	7/16	5/8	7/16	19/32	+ 3/32
2 31/32	2 5/32	12 1/2	Trinidad Leasehold	2 9/16	2 29/32	2 9/16	2 27/32	+ 9/32
5/16	3/16	....	Untd. Brit. of Trinidad (6s. 8d).	1/4	9/32	1/4	9/32	+ 1/32
1 31/32	1 1/32	12 1/2	Venezuelan Oil Concessions	1 29/32	1 31/32	1 15/16	1 29/32	+ 3/16

Nominal value of shares £1 unless otherwise stated by bracketed figures.
*Denotes tax-free dividend. †† 10 percent dividend tax free plus 4 percent bonus less tax.

a persistent investment demand, which also affected Trinidad Leaseholds, Lobitos and other shares.

PUBLICATION of the full accounts of the Anglo-Persian for 1932 confirmed the excellent impression created by the preliminary statement, recorded in WORLD PETROLEUM last month. Net profit of £2,379,677, which compares with £2,318,717 for 1931, was struck after charging not only £1,502,778 in respect of 1932 royalties and taxation on the basis arrived at in recent negotiations with the Persian Government, but also £1,142,353 representing a final settlement up to the end of 1931. The company was able to provide these huge sums partly as a result of an increase in trading profit from £3,211,661 to £5,024,852, but the accounts suggest that its great strength, built up in the past by the prudent policy of the directors, has stood it in good stead at the present time. It is clear from the balance sheet that the company still occupies a position of almost impregnable strength. Total liquid assets have risen by about £4,000,000 on the year, with big increases in holdings of cash and British Government securities.

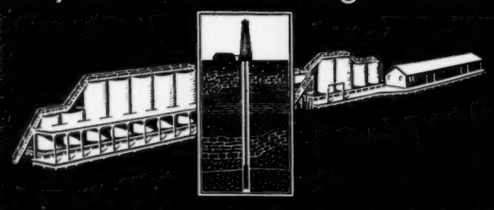
Sale of Anglo-Persian products was well maintained last year despite the decrease in world consumption of oil. Part of the company's increased profit was due to a price rise in several selling markets in the autumn. The directors state that operations in Persia were satisfactory, and that the company's association with the Royal Dutch-Shell group in Great Britain has given satisfactory results. Anglo-Persian has taken over all royalty payments to the Persian Government, formerly paid out of the profits of the First Exploration Company, the principal oilfields subsidiary. Consideration for the assumption of this liability is a reduction in the price paid by the parent company to its affiliate. This change will enable Anglo-Persian shareholders to see all royalty payments in Persia in the accounts of their own company.

RESULTS announced by two British companies operating in Roumania were both satisfactory to the market. Phoenix Oil and Transport earned a net profit of £162,473 for 1932, compared with £149,449 in the preceding year, and resumed dividends on its share capital by paying 2½ percent on its £1 shares, and 27⅞ percent on its one shilling shares under their participating rights. Improvement in results was evidently due in part to the increase in the output of the group of which Phoenix is the centre. The subsidiary companies were able last year to provide their own depreciation, which was provided in 1931 by the parent. Finances of the latter have been greatly strengthened as a result of the past year's operations, and the directors certainly seem justified in expressing satisfaction with the results. Steaua Romana (British) whose principal assets consist of an investment in and advances to a Roumanian Company of similar name, has received a payment from the latter of interest which had been deferred. In addition to the usual interim dividend of two percent to its ordinary shareholders, the British company is therefore making a special distribution of two percent from the interest payment. The special payment is quite separate from the arrears of dividend on Steaua Romana ordinary shares, which are entitled to eight percent cumulative, and now carry arrears of about 60 percent.

STRINGENT economies were put into force by the Mexican Eagle last year to cope with continued low prices for oil products. This policy, with an increase from 12,098,066 bbl. to 13,537,822 bbl. in production, gave the company a slightly higher revenue. Profit, including interest, and after charging exploration outlays, was $10,230,917 (Mexican) against $10,057,224 in the preceding year. Canadian Eagle earnings at $896,392 (Canadian) were considerably reduced. Both companies, in addition to paying their first preference dividends, are making distributions on their participating preference capital. Mexican Eagle is paying one year's dividend on this class and the Canadian company 23.88 cents per participating share of no par value. The distributions were a pleasant surprise for the market; but the response of the share quotations was not considerable.

ALEC H. DAY

From the bottom of the well to your own storage tanks



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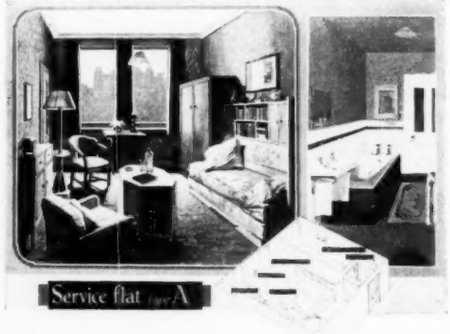

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